A PRELIMINARY INVESTIGATION OF HOW TO TEACH UNDERGRADUATE STUDENTS HOW TO BUILD RAPPORT AND CREATE MEANINGFUL INTERACTIONS WITH COLLEGE-AGED STUDENTS WITH AUTISM SPECTRUM DISORDER

Williams A. Espericueta-Luna, B.S.

Thesis Prepared for the Degree of

MASTER OF SCIENCE

UNIVERSITY OF NORTH TEXAS

August 2021

APPROVED:

Samantha Bergmann, Committee Chair
Joseph Dracobly, Committee Member
Karen Toussaint, Committee Member
Manish Vaidya, Committee Member and Chair of the Department of Behavior Analysis
Nicole Dash, Dean of the College of Health and Public Service
Victor Prybutok, Dean of the Toulouse Graduate School

Espericueta-Luna, Williams A. *A Preliminary Investigation of How to Teach Undergraduate Students How to Build Rapport and Create Meaningful Interactions with College-Aged Students with Autism Spectrum Disorder*. Master of Science (Behavior Analysis), August 2021, 70 pp., 4 tables, 13 figures, 6 appendices, references, 49 titles.

University peer-mentoring programs have shown to increase the retention rates of students, including students with autism spectrum disorder (ASD), and improved satisfaction with the college experience. The perceived quality of a mentee-mentor relationship may predict satisfaction with a peer-mentoring program; therefore, teaching peer mentors to engage in behaviors that could contribute to a high-quality mentee-mentor relationship may be beneficial. The current study identified target outcomes, operationally defined target behaviors, and developed a computer-based instruction (CBI) training module. The CBI training module was divided into four submodules that incorporated teaching through examples and nonexamples and discrimination training. The efficacy of each CBI submodule was evaluated using a pretest/posttest design with two mentors in a university peer-mentoring program. Results suggested that the CBI training module produced an increase in the frequency of correct responses in seven out of eight submodule posttests across both participants. The CBI training program also produced an increase in the frequency of target behaviors emitted by both participants across all submodules. These findings suggest that this CBI training module can be used to teach peer-mentors the behaviors that may improve their relationship with their mentee.

ACKNOWLEDGEMENTS

I would like to thank my thesis advisor, Dr. Sam Bergmann, for serving as an exemplary mentor, and for her unwavering support, and encouragement throughout my academic journey. I would also like to thank Dr. Traci Cihon for welcoming me into the world of behavior analysis during my first day as an undergraduate student at UNT. Dr. Cihon has been an exemplary mentor, has always encouraged me to be the best behavior analyst that I can be, and inspired me to be unafraid to ask the big questions. I have learned so much from both professors and will forever be grateful to have been their student.

I would like to thank Drs. Karen Toussaint, Joseph Dracobly, and Manish Vaidya for serving as my committee members and providing me with your feedback on my project, as well as for the encouragement and support along the way. I would also like to thank every faculty member in the Department of Behavior Analysis. I have learned an incalculable amount from each faculty member, and I appreciate every conversation that we have had both inside and outside the classroom.

I would like to thank Michelle Castillo, the Armshaw brothers, Carlos Lopez, Tomas Urbina, Haven Niland, and many of my friends and colleagues in the Department of Behavior Analysis for the advice, feedback, and friendship over the years. I was lucky to have been a part of the UNT family.

Last, but not least, I would like to thank my parents, my sisters, my many family members, and my friends from home because you all were a part of my journey and supported me in ways that I could never possibly repay. Thank you for, literally, everything.

TABLE OF CONTENTS

Page

ACKNOWLEDGEMENTS iii

LIST OF TABLES vi

LIST OF FIGURES vii

CHAPTER 1. INTRODUCTION 1

CHAPTER 2. METHOD 5

Participants 5

Materials 6

Computer Training 6

Target Behavior Selection 6

Submodule Creation 7

Response Measurement and Reliability 11

Procedure 18

Pretests and Posttests 19

Instruction 20

Social Validity 27

CHAPTER 3. RESULTS 29

CHAPTER 4. DISCUSSION 37

APPENDIX A. COMPONENT BEHAVIORS RELATED TO EACH OUTCOME 46

APPENDIX B. QUESTIONS FROM SOCIAL VALIDITY OF COMPONENT BEHAVIORS SURVEY 48

APPENDIX C. BUILDING RAPPORT AND CREATING MEANINGFUL INTERACTIONS TRAINING OBJECTIVES 51

APPENDIX D. QUESTIONS USED ON THE PRETEST AND POSTTEST 53

APPENDIX E. QUESTIONS USED FOR THE DISCRIMINATION TRAINING FOR EACH TARGET BEHAVIOR 57

APPENDIX F. DISCRIMINATION TRAINING QUESTION ARRANGEMENT FOR EACH TARGET BEHAVIOR 64

REFERENCES 66

LIST OF TABLES

Page

Table 1. Operational Definitions, An Example Antecedent, And Example and Nonexample of Target Behaviors Taught within the Training 12

Table 2. Operational Definitions, an Example Antecedent, and an Example of Behaviors to Avoid 14

Table 3. Trial-by-Trial Interobserver Agreement Across Each Submodule 16

Table 4. Social Validity Survey Questions and Results 28

LIST OF FIGURES

Page

Figure 1. Overview of Computer-Based Instruction Training Module 8

Figure 2. Content Included in the Instruction Phase 9

Figure 3. Example of a Pre- and Posttest Question with Corresponding Image and Evocative Scenario 20

Figure 4. Example of an Introduction to Target Outcome 21

Figure 5. Example of Introduction Target Behavior Slide 22

Figure 6. Example of Considerations Slide 23

Figure 7. Example of Common Situations Slide 23

Figure 8. Example of Teaching Through-Examples-and-Nonexamples Slide 25

Figure 9. Example of a Discrimination Training Question and Feedback Provided After a Response 27

Figure 10. Amy and Morgan's Frequency of Correct Responses Across Submodule Pretests and Posttests 30

Figure 11. Frequency of Behaviors Emitted Across Submodule Pretests and Posttests for Amy and Morgan 31

Figure 12. Scatter Plot Showing Occurrence of Target Behaviors Across Submodule Pretests and Posttests for Amy 33

Figure 13. Scatter Plot Showing Occurrence of Target Behaviors Across Submodule Pretests and Posttests for Morgan 36

CHAPTER 1

INTRODUCTION

The value of a postsecondary education, which includes degree programs from a 2-year and 4-year college and university, and certifications from technical and vocational schools, cannot be understated. The U.S. Bureau of Labor Statistics (2020) reported that higher levels of educational attainment increased earnings and decreased risk of unemployment. Unfortunately, only about 36% of young adults with autism spectrum disorder (ASD) have received any form of postsecondary education with only 30% of young adults with ASD pursuing some form of college education (Roux et al., 2015). Lack of postsecondary education could contribute to disadvantages adults with ASD experience in the areas of employment, social relationships, and overall quality of life (Howlin & Moss, 2016). Therefore, it is important to identify the barriers to postsecondary success and work to ameliorate or eliminate these barriers.

Many young adults with ASD who pursue higher education have the requisite academic skills to perform well at a university (Kapp et al., 2011; Lucas & James, 2018). Nevertheless, young adults with ASD are likely to underperform at a university (Cederlund et al., 2008) due to struggles with social and independent living skills which are important to success at and satisfaction with the university experience (Elias & White, 2018; White et al., 2016). Additionally, many students with ASD reported a lack of social support and mental health concerns (i.e., anxiety, loneliness, and depression) while attending college (Gelber et al., 2014). Young adults with ASD who are pursuing a degree at a university may overcome some of these challenges and successfully navigate the university experience if provided additional, dedicated support that address development of communication, social, and independent living skills (VanBergeijk et al., 2008).

Peer-mentoring programs offer one potential support option to help meet the needs of college students with ASD. Peer-mentoring programs involve pairing a student (i.e., mentee) with a more experienced university student (i.e., peer mentor; Terrion & Leonard, 2007). Peer-mentors are of similar age and provide guidance and support to the mentee (Kram, 1983; Kram & Isabella, 1985). Peer-mentoring programs at universities and colleges have improved student retention and satisfaction with the first-year experience for students in general (Flores & Estudillo, 2018; Hall & Jaugietis, 2010; Yomtov et al., 2017) and students with ASD (Ames et al., 2016; Lucas & James, 2018). Specifically, Lucas and James (2018) found that students with ASD reported greater success and satisfaction in navigating their life at the university, creating social relationships, and maintaining good mental health after participating in a peer-mentoring program.

The success of a peer-mentoring program rests heavily on the relationships formed with peer mentors. Lucas and James (2018) found that the quality of the mentee-mentor relationship predicted the mentees' satisfaction with the peer-mentoring program. Several peer-mentor behaviors were suggested as contributors to high-quality relationships: demonstrating active listening, using good communication skills, developing a trusting and supportive relationship, and supporting mentee growth, (e.g., Garringer & Jucovy, 2007; Hall & Jaugietis, 2010; Terrion & Leonard, 2007; *Peer Mentoring Handbook*, n.d.). To promote greater satisfaction with peer-mentoring programs, these behaviors could be taught to peer mentors to help promote high-quality relationships.

Behavior analysts have demonstrated that complex social skills can be improved through delivery of instruction geared toward teaching component behaviors (Kisamore et al., 2018). For example, Custer et al. (2021) taught 5 adults with ASD conversational skills using computer-

based instruction (CBI) coupled with practice opportunities with peers. The training package led to improved skills in 12 of 13 skills across participants. Computer-based instruction (CBI) is a method of training and education delivery that has been shown to be an effective method of instruction for teaching social skills to adults and children with ASD (Custer et al., 2021; Simpson et al., 2004). An advantage of implementing CBI is that instruction is student-paced, easily administered, and requires active responding to instructional material to advance (Johnson & Rubin, 2011). Although untested, CBI may be a viable option for teaching peer mentors to engage in target relationship skills like helping a mentee grow.

Integrating behavior-based instructional design could further improve CBI (Johnson, 2014). Behavior-based instructional design refers to behavior analytic approaches and strategies used to design and evaluate instructional material (Johnson, 2014). Use of these strategies to develop instructional materials has shown to produce increases in student learning (Huffstetter et al., 2010; Johnson & Street, 2012). An instructional strategy that could be helpful for teaching relationship skills is teaching through examples-and-nonexamples (Tiemann & Markle, 1990). For example, active listening could be taught by presenting examples of an individual engaging in active listening, and nonexamples of an individual engaging in behaviors associated with poor listening skills (i.e., looking around the room while a conversation partner is speaking). Additionally, presenting participants with at least three example and nonexample pairs may increase the likelihood that the participant emit the target behaviors in untrained situations (Layng, 2019; Tennyson & Park, 1980; Tiemann & Markle, 1990).

Designing instructional materials that incorporate discrimination training can bolster student learning (Johnson & Layng, 1994). Discrimination training involves differentially applying consequences for responses in the presence of a specified antecedent stimulus. In a

typical operant chamber example, an experimenter can teach a rat to press a lever by providing reinforcement for responses in the presence of a red light and withhold reinforcement (i.e., extinction) for responses in the presence of a green stimulus. Overtime, the responding will differentiate and will almost exclusively occur in the presence of the red light and little to no responding will be observed in the presence of the green light. Similarly, discrimination training could be used to teach peer mentors to identify target behaviors and situations in which target behaviors should occur. A CBI training module that incorporates teaching through examples-and-nonexamples and discrimination training where a participant selects from examples and nonexamples may lead to the emission of target behaviors under appropriate conditions in the future (Johnson & Layng, 1994). For the purposes of this training, this combined approach could be used to teach peer mentors the topography of the behaviors that may improve the relationship between a mentee and peer mentor, in addition to the conditions under which the behaviors should occur.

The peer-mentoring literature hypothesized that higher-quality mentee-mentor relationships involved peer-mentors engaging in component behaviors related to demonstrating good active listening and communication skills, creating a trusting and supportive relationship, and helping the mentees grow (Garringer & Jucovy, 2007; Hall & Jaugietis, 2010; Terrion & Leonard, 2007; *Peer Mentoring Handbook*, n.d.). A behavior analytic training program that teaches peer mentors the component behaviors that hypothetically produce the target outcomes would be beneficial. Therefore, the purpose of this study was to evaluate the effects of a CBI training program that taught component behaviors through examples-and-nonexamples on peer mentors' typed responses to scenario questions.

CHAPTER 2

METHOD

Participants

Two, neurotypical, 20-year-old undergraduate students enrolled at a public university in the southern region of the United States served as participants in the current study. Amy identified as a cisgender female and had completed three years of a social science major. Morgan identified as non-binary and had completed two years of a social science major. The participants volunteered for unpaid mentor positions with a university's on-campus peer-mentor program for neurodiverse college students. The peer-mentor program offered a cohort-based experience in a campus residence hall, two levels of peer-mentoring (i.e., undergraduate social support mentor and graduate behavioral intervention mentor), and connections to an extended network of support through collaborative relationships with other programs at the university (e.g., counseling and testing services, academic supports). All volunteer peer mentors agreed to participate in training when they accepted their offer to join the program; however, they had the option to provide consent for researchers to access their training data. The project was approved by the university's human subjects institutional review board. The researcher reviewed the informed consent packet with all peer mentors who responded affirmatively to email messages to complete training (one peer mentor stopped responding to emails about training and their data are not included in this study). If a peer mentor did not provide consent for use of their data for research purposes, the researcher would have completed their training without analyzing their performance data. However, Amy and Morgan provided consent.

Materials

Computer Training

The researchers conducted the study through an online format. The training sequence was administered asynchronously through Bridge© Learning Management System (LMS) and involved no face-to-face interactions between the researcher and participants. The computer-based training module for this experiment was part of a larger training sequence to prepare peer mentors volunteering for the university's peer-mentor program for neurodiverse students. The training sequence consisted of the following modules: an introduction to the program and a peer mentor's role and responsibilities, building rapport and creating meaningful relationships with their mentees (the current project), navigating the university experience, and providing resource recommendations and referrals to the mentees. Participants used their personal computers to access the training program.

Target Behavior Selection

During the early development of the CBI training module, the researcher consulted the peer-mentoring literature to identify classes of peer-mentor behaviors that may lead to a better relationship with the mentee (Garringer & Jucovy, 2007; Hall & Jaugietis, 2010; Terrion & Leonard, 2007; *Peer Mentoring Handbook*, n.d.). A list of all the behaviors that were hypothesized to lead to each outcome was compiled by the researcher (Appendix A).

This list included more behaviors than we could teach within the CBI training module, so we developed a social validity survey to identify target behaviors (Appendix B; Wolf, 1978). The social validity survey included questions for behaviors that contributed to desired outcomes: active listening, communication skills, trust and support, and growth. Each question pertained to a component behavior (e.g., stating that the peer mentor would provide encouragement) related

to a target outcome (e.g., growth), and included an example scenario image to illustrate a peer mentor emitting the component behavior. The social validity survey was distributed to mentees (i.e., six undergraduate students who identified as neurodiverse and were part of the cohort-based peer-mentor program), and the five mentees who completed the survey rated each behavior according to how much they believed the peer-mentor behavior would contribute to the development of a good relationship on a 5-point Likert scale (i.e., 0 [*none*] to 4 [*a lot*]). We included the three target behaviors within each target outcome that were rated as most important by the mentees in the CBI training module. The behaviors for active listening included be patient, paraphrase, and look interested. The behaviors for communication skills included ask open-ended questions, reflect, and allow control of conversation. The behaviors for trust and support included provide a safe space, be there, and offer assistance. The behaviors for growth included encourage, promote problem solving, and have fun.

Submodule Creation

Researchers created the CBI training module's instructional content, discrimination training questions, and submodule assessment questions using Microsoft PowerPoint™ before transferring all instructional material to Bridge© (LMS). We used the Bridge© default font type (i.e., avenir) in size 24 (pretest, posttest, and discrimination training) and size 15 (instructional content, bullets). Overall, the CBI training program contained 249 slides, excluding reference slides. The training began with a four-slide introduction before proceeding to the first of four submodules. Each submodule included approximately 40 slides, which included the pretest (five slides), instruction (30 slides), and posttest (five slides; Figure 1). The pretest and posttest slides included written scenarios, a corresponding picture (obtained from a stock image website; www.pexels.com), and a text box for the participant's response (see Figure 3).

Figure 1

Overview of Computer-Based Instruction Training Module

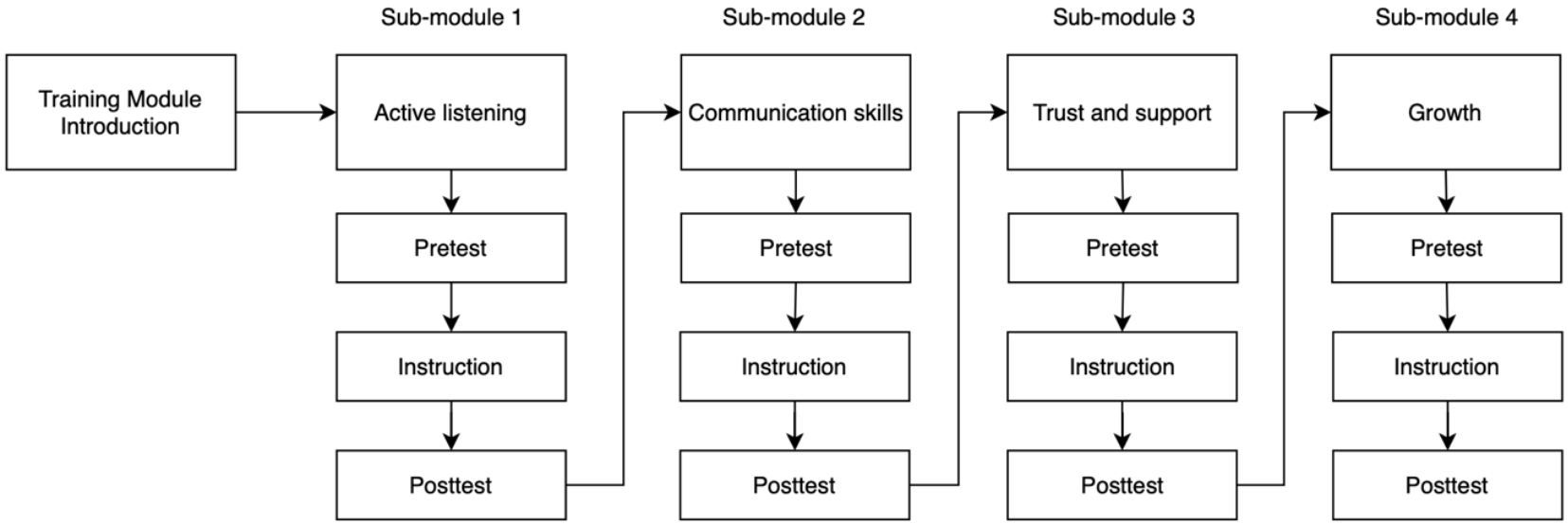
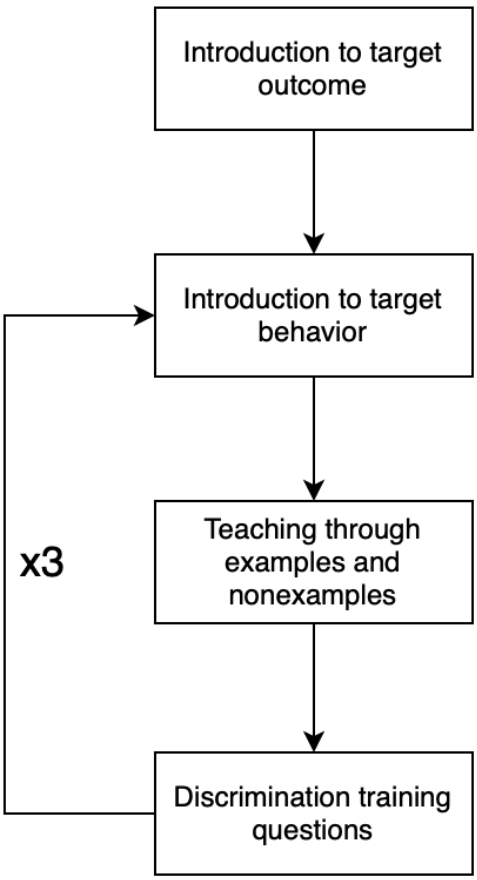


Figure 2

Content Included in the Instruction Phase



Note. All steps but the introduction to the target outcome were repeated to teach each target behavior (e.g., first "be patient", then "paraphrase", and finally "look interested"). There were three target behaviors per submodule.

The questions used in a submodule pretest were also used for the corresponding posttest and the order of the questions were randomized using a random-number generator (www.randomizer.org). The questions were presented in same order to both participants. The instruction portion of each submodule (Figure 2) included slides to introduce the target outcome and target behaviors (see Figure 4 and Figure 5, respectively), transitions between components, situations when the target behavior was appropriate (i.e., relevant antecedents; see Figure 7), and examples and nonexamples (see Figure 8), and discrimination training (see Figure 9).

Photos to construct the teaching through examples and nonexamples instructional content were obtained from a stock image website (www.pexels.com) and efforts were made to select photos to show a variety of races, ethnicities, and genders. The pictures depicted two people communicating through different mediums (e.g., phone call, text message, video call, or in-person), across different activities (e.g., eating lunch, playing a game, going for a walk), and across settings (e.g., university campus, a restaurant, a local park). If a suitable image was not found, pictures were taken of graduate students modeling the target behavior. This only occurred once for the look interested target behavior. The same picture was used for one example and nonexample pair (see Figure 8), but pictures were not repeated across other examples, nonexamples, or submodules. The example-and-nonexample scenarios were created by copying the picture to a Microsoft PowerPoint™ slide, inserting callout shapes as speech bubbles, numbering each speech bubble, and writing text to create a conversational exchange between the mentor and mentee. The text within the speech bubble was white and used a Calibri 20-point font. Generally, dialogue was initiated by the mentee and the number of speech bubbles varied from three to six (i.e., one to three conversational exchanges per example or nonexample scenario).

To determine which questions in discrimination training would be an example or nonexample, target behaviors were assigned a number (i.e., 1 to 15) and arranged in order. Then, a random number generator (www.randomizer.org) was used to assign each set a number: 1 or 2. These numbers were used to determine whether the target behavior would include one example and two nonexamples or two examples and one nonexample. Next, sequences of one and two example combinations were generated (e.g., example, example, nonexample and example, nonexample, example) and assigned a random number between 1 and 3 to determine the

arrangement of examples and nonexamples for each set (see Appendix F).

Response Measurement and Reliability

Based on the results of the social validity survey, we created operational definitions for the following target behaviors: be patient, paraphrase, look interested, open-ended questions, reflect, control of the conversation, provide a safe space, be there for mentee, offer assistance, encourage, problem solve, and have fun. To aid in discrimination of the target behaviors, we also developed examples, nonexamples, and relevant antecedent conditions for each target behavior (Table 1). Some target behaviors required a response from the mentee to set the occasion for a target response emitted by the peer-mentor. For example, a mentee must make a statement before a peer-mentor can paraphrase. The emission and frequency of target behaviors following scenarios were the dependent variables of the study.

Additionally, the literature suggested that six behaviors may have a negative impact on a mentee-mentor relationship (Garringer & Jucovy, 2007; *Peer Mentoring Handbook*, n.d.). The behaviors were operationally defined in Table 2 and included: indices of boredom, interrupting, pushing the mentee to talk, providing disapproval, pushing mentee to change, and preaching about personal values. These behaviors were not specifically targeted in the CBI training module, but we measured whether they occurred to examine if our training reduced the frequency of behaviors to avoid as well.

The researcher analyzed the participant's typed responses to each question on the submodule pretest and posttest. Participant responses were scored using a five-step coding system. First, the researcher determined if the participant's response to the scenario was correct or incorrect. A correct response was defined as a typed response that included at least one of the three target behaviors for the target outcome (e.g., "safe space" for trust and support).

Table 1

Operational Definitions, An Example Antecedent, And Example and Nonexample of Target Behaviors Taught within the Training

Outcome	Behavior	Operational definition	Example	Nonexample
Active listening	Be patient	Mentor allows mentee to start and finish speaking; can include waiting quietly or providing encouragement to speak when ready	(Mentee stops talking in middle of sentence) "It's okay, you can take your time to think about what you want to say."	"I don't have all day."
	Paraphrase	Mentor rephrases or summarizes the preceding statement	(Mentee talks about new lab partner) "So you are beginning to develop a great relationship with your lab partner?"	"Okay."
	Look interested	Mentor leans forward [a], makes eye contact [b], maintains body orientation [c], and provides feedback [d]	(Mentee is telling story) Orient body toward mentee, look them in the eyes and say "ah-huh." as the mentee speaks.	Look away at a text on your phone and yawn.
Communication skills	Open-ended questions	Question that requires more than a yes or no response [e]	"What do you like about your university experience so far?"	"Do you like the university so far?"
	Reflect	Mentor statement that describes the perspective and emotions of the mentee [f]	(Mentee says that they think they have too many assignments) "It must feel really frustrating to be assigned that much work."	"It's not that much work."
	Control of conversation	Mentor allows the mentee to initiate conversational topic and they follow the mentees initiation	(Mentee changes conversation topic from grades to airplanes) "Sure, we can talk about airplanes. What do you find interesting about them?"	"Instead of talking about that, let's talk about how your exam went!"
Trust and support	Safe space	Mentor describes the environment as free of criticism	(Mentee hesitantly asks for advice on a person problem) "Feel free to share what you would like; I am not here to judge."	"Why would you get yourself into that situation?"

(table continues)

Outcome	Behavior	Operational definition	Example	Nonexample
	Be there	Mentor states that they are willing and able to provide assistance to the mentee	(Mentee apologizes for asking for advice) "It's no problem at all, I am glad you came to me."	"Try not to ask for help so often."
	Offer assistance	Mentor statement that provides the mentee with information or help	(Mentee asks for help finding a bookstore) "I buy my books at Voertman's›. Would you like me to show you where it is?"	"You're on your own on this one."
Growth	Encouragement	Mentor statement that indicates the mentee can do well in activities that they engage in	(Mentee is nervous about their sports competition) "You're going to do great!"	"You're going to need all the luck you can get."
	Problem solve	Mentor statement that guide student toward a solution without giving the answer directly [g]	(Mentee is having trouble accessing the internet) "In the past, how have you resolved problems like this? Do you think one of those ways would be helpful in this case?"	"Let me fix it, you'll take too long."
	Have fun	Mentor initiates conversation or activity involving either known preferred topic or activity or a topic or activity the mentee expresses an interest in	(Mentee invites mentor to play a game) "I've never played ping pong, but I'll try it if you show me how to play."	"No thanks, that sounds terrible."

Note. Statements within parentheses are an antecedent for the mentor's response. [a] Forward lean was defined as trunk of body is leaning forward toward the speaker (Blell, 2010). [b] Eye contact was defined as looking directly in the eyes of the speaker while listening (Hood et al., 2017 & Nuernberger et al., 2013). [c] Body orientation was defined as trunk of body is facing the student and shifts the direction of body if speaker moves (Blell, 2010). [d] Feedback was defined as vocalizations and gestures emitted when mentee was speaking (e.g., "uh huh," "I see," nodding; Hood et al., 2017; Nuernberger et al., 2013). [e] Custer et al. (2020).[f] Reflecting & Paraphrasing, (n.d.).[g] Kieta et al. (2019)

Table 2

Operational Definitions, an Example Antecedent, and an Example of Behaviors to Avoid

Behavior	Operational definition	Example
Indices of boredom	Mentor statement that describes disinterest in the conversation [a]	(While mentee is speaking) Mentor glances at a notification on their smart watch.
Interrupting	Mentor statement emitted prior to the conversation partner finishing their response [b]	(While mentee is speaking) "Did you catch the news last night?"
Pushing mentee to talk	Mentor statement that suggests or demands that the mentee engage in the conversation	(Mentee is sitting quietly drinking their coffee while meeting with mentor) "Stop being so quiet and say something?"
Providing disapproval	Mentor statement that expresses an unfavorable opinion regarding the mentee	(Mentee receives a D on their math test) “I am disappointed with how you did on that test.”
Pushing mentee to change	Mentor instructs mentee to complete goals or tasks that were not selected by the mentee	"You need to bring up your grades before midterms."
Preaching about personal values	Mentor statement that suggests or demands the mentee conform to the mentor's beliefs or opinions or discusses topics that the mentor and mentee disagree on	(Mentee talks about wanting to spend more time with friends) "It's important to prioritize school over friends. Friends are temporary, but an education is forever."

Note. Statements within parentheses are an antecedent for the mentor's response. [a] Indices of boredom was defined as any statements that describe: looking at a cellphone or watch, yawning, looking around the area, or doodling (Hood et al., 2017). [b] Hood et al. (2017)

An incorrect response was defined as a typed response that did not include at least one of the target behaviors for the target outcome. Next, if the participant emitted a correct response, the researcher scored the occurrence and nonoccurrence of the three target behaviors that were identified for each target outcome. The researcher also scored whether the participant emitted a target behavior associated with any other target outcome. If the researcher identified that the participant engaged in other target behaviors, the researcher scored the occurrence and nonoccurrence of the nine behaviors from the other target outcomes. Finally, the researcher scored the occurrence and nonoccurrence of behaviors to avoid.

An independent data collector was trained to score responses using the five-step coding system. The researcher and the independent data collector scored two sets of responses to evocative scenario questions provided by two volunteer graduate students to practice and discuss discrepancies. The mastery criterion was set at 80% across each step of the five-step coding system and was achieved after scoring the second set of responses.

Item-by-item interobserver agreement (IOA) was calculated for each outcome and response across the five-step coding system (Cooper et al., 2020). An independent data collector scored 100% of participants' responses to the pretest and posttest questions ($N = 80$). For each response on a pretest or posttest, agreement was defined as both observers coding that a response occurred or that a response did not occur. A disagreement was defined as one observer recording that a response occurred and the other observer scoring that a response did not occur. Then, percentage of agreement across submodule pretest or posttest questions was calculated for each step of the five-step coding system (e.g., target outcome, target behaviors). The numerator was obtained by summing the number of agreements, and the denominator was obtained by summing the total number of responses on each step.

Table 3

Trial-by-Trial Interobserver Agreement Across Each Submodule

Five-step coding system	Amy		Morgan	
	Pretest	Posttest	Pretest	Posttest
Active listening				
Target outcome	100%	100%	80% (0%-100%)	80% (0%-100%)
Target behaviors	100%	100%	93% (67%-100%)	93% (67%-100%)
Other outcomes	80% (0%-100%)	100%	100%	100%
Other behaviors	98% (89%-100%)	100%	98% (89%-100%)	100%
Behaviors to avoid	97% (83%-100%)	100%	97% (83%-100%)	100%
Communication skills				
Target outcome	80% (0%-100%)	100%	100%	100%
Target behaviors	87% (67%-100%)	87% (67%-100%)	93% (67%-100%)	93% (67%-100%)
Other outcomes	80% (0%-100%)	80% (0%-100%)	80% (0%-100%)	80% (0%-100%)
Other behaviors	98% (89%-100%)	98% (89%-100%)	93% (78%-100%)	98% (89%-100%)
Behaviors to avoid	97% (83%-100%)	100%	100%	100%
Trust and support				
Target outcome	100%	100%	100%	100%
Target behaviors	93% (67%-100%)	93% (67%-100%)	87% (33%-100%)	100%
Other outcomes	100%	100%	100%	80% (0%-100%)
Other behaviors	100%	100%	98% (89%-100%)	98% (89%-100%)
Behaviors to avoid	100%	100%	100%	100%
Growth				
Target outcome	100%	100%	100%	80% (0%-100%)

(table continues)

Five-step coding system	Amy		Morgan	
	Pretest	Posttest	Pretest	Posttest
Target behaviors	93% (67%-100%)	100%	100%	93% (67%-100%)
Other outcomes	100%	100%	100%	60% (0%-100%)
Other behaviors	93% (78%-100%)	100%	98% (89%-100%)	96% (89%-100%)
Behaviors to avoid	100%	100%	100%	100%

Note. Ranges are reported in parentheses. Other outcomes refer to target outcomes from other submodules. Other behaviors refer to target behaviors from other outcomes.

Item-by-item IOA was calculated by dividing the sum of responses agreed on by the total number of responses and multiplying by 100. Table 3 shows the results of the calculations.

Average IOA across each step of the five-step coding system for all four submodules was at least 80% in the pretest and posttest for both Amy and Morgan's responses except for the growth submodule for Morgan; two disagreements occurred on the occurrence of other outcomes within the posttest (i.e., 60% agreement; see Table 3).

Procedure

The study used a pretest/posttest design to evaluate the effects of the CBI training module on the emission and frequency of target behaviors. The CBI training module consisted of an introduction and four submodules corresponding to each target outcome. The submodules were presented in the following order: active listening, communication skills, trust and support, and growth (see Figure 1). The training sequence began when the Bridge© administrator unlocked the introduction for the participant. After completing the introduction, the participant progressed automatically to the first submodule. From then on, the completion of one submodule granted access to the next submodule. The participant could access Bridge© at any time and progress at their own pace. The researcher asked the participant to complete the training program in one week, but there were no required deadlines. University administrators that managed access to Bridge© notified researchers when the participant completed the training program. Amy's average submodule completion time was 25 min (Range, 15 min - 49 min). Morgan's average submodule completion time was 23 min (Range, 16 min-28 min).

The introduction included the module's training objectives (see Appendix C) in the first slide. The second slide described the role of the peer mentor (i.e., friend, support system, resource, and guide to the mentees) and the effects peer-mentoring programs can have on

mentees (i.e., improved student retention and satisfaction with their college experience; Lucas & James, 2018). The third slide presented the target outcomes, stated that the peer mentor's relationship would take time to develop, and that the subsequent submodules would provide peer mentors with the tools they needed to achieve the target outcomes. The last slide (i.e., end of submodule slide) congratulated the participant for completing the introduction submodule.

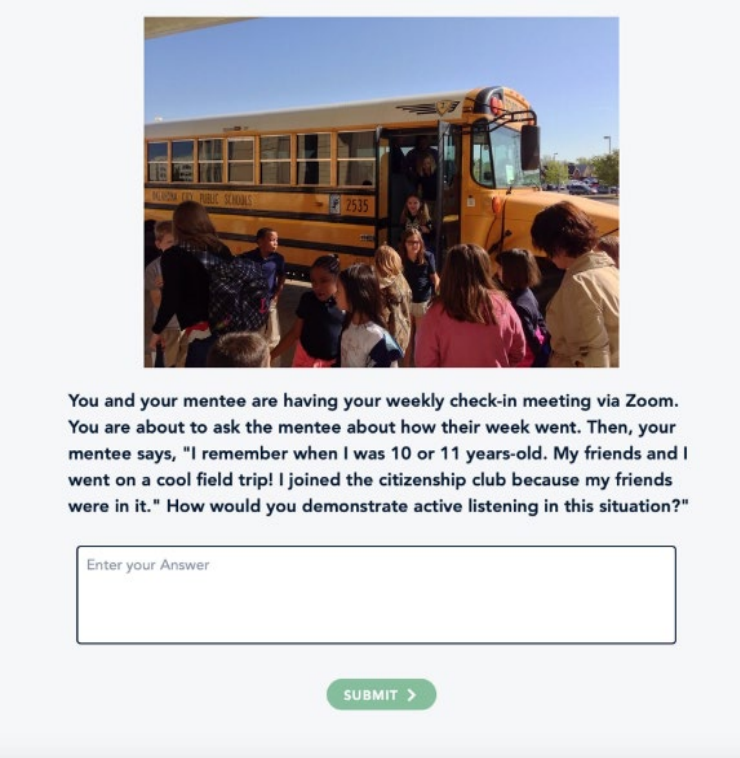
Pretests and Posttests

Pretests were the first stage of each submodule and were completed prior to beginning instruction on the target outcome. At the outset of the pretest, an instruction slide was presented to the participant that stated the following: "I am going to present you some potential scenarios over (e.g., ACTIVE LISTENING). Read the provided scenarios. After you read the scenario, describe (write-out) how you would respond in that situation."

Within each submodule, the pretest included five questions and the presentation order was randomized (www.randomizer.org). As shown in Figure 3, each pretest/posttest slide contained an image, an evocative scenario, a question, and a textbox. Evocative scenarios illustrated a hypothetical situation by describing a location and activity that the peer mentor and mentee were engaging in, mentee dialogue, and other contextual information, if necessary. The question asked participants "How would you demonstrate (e.g., active listening) in this situation?" The participant typed their response in a textbox below the evocative scenario. When the response was submitted, Bridge© displayed a message that thanked the participant for their response and allowed the participant to move on to the next question. The participant did not receive any other form of feedback. At the conclusion of the pretest, the participant was presented with a transition slide that thanked them for their responses and informed them that the submodule instruction section would begin.

Figure 3

Example of a Pre- and Posttest Question with Corresponding Image and Evocative Scenario



The posttest slides were constructed in the same way as the pretests. A posttest included the same five questions as the corresponding pretest and were completed following instruction of all three target behaviors. At the conclusion of each posttest, the participant was told "Congratulations! Great work completing the (e.g., active listening) section. We will now move on to the next section of the training sequence."

Instruction

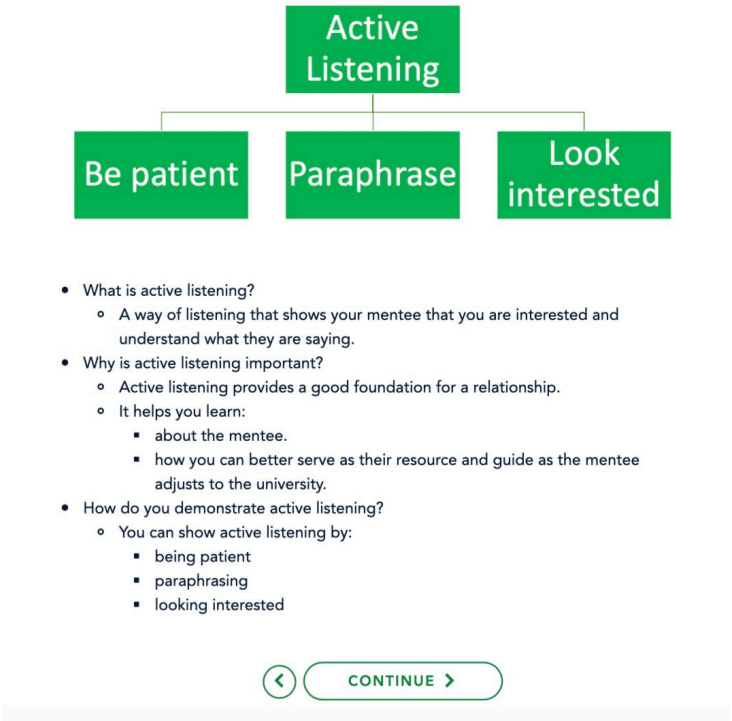
Introduction to Target Outcome

The first slide introduced the target outcome (Figure 4). A structural hierarchy diagram was displayed at the top of the slide to show the relationship between the target outcome and the target behaviors. The information on the slide was presented as questions to try to establish an

intraverbal between questions that a mentee might ask themselves (i.e., a verbal antecedent stimulus) and the answer to the question (i.e., a verbal response that is maintained by a generalized conditioned reinforcer; Skinner, 1957). The question asked participants "What is (e.g., active listening)?" and provided the answer using common vernacular (see first black bullet, Figure 4). The second question asked participants "Why is (e.g., active listening) important?" and was designed to try to create an establishing operation (Michael, 1993) for consumption of the information and future emission of the target behavior (see second black bullet, Figure 4). The question asked participants "How do you demonstrate (e.g., active listening)?" and introduced the three behaviors that were targeted in the submodule (see third black bullet, Figure 4). The participant was then presented with a transition slide that stated, "Let's talk about the target behavior: (e.g., be patient)."

Figure 4

Example of an Introduction to Target Outcome



Introduction to Target Behavior

Target behaviors for each outcome were taught sequentially (e.g., first "be patient", then "paraphrase", and finally "look interested"). As shown in Figure 5, a yellow star was placed on the target behavior to signal which target behavior was the current focus. The introduction to behavior slide presented the same two questions as the introduction to target outcome (first two bullet points; see Figure 5). However, the third question asked, "how do I show (e.g., my mentee that I am being patient)?" and was answered by providing a description of the topography of the target behavior instead of providing the name of the target behavior (see third bullet, Figure 5). Then, a slide was presented that provided information about things to consider when emitting a target (Figure 6). Next, the participant was presented with a table that contained possible antecedents for the target behavior, examples of mentee responses that may serve as an antecedent, and examples of mentor responses. These were intended to show possible situations in which to emit the target behavior and differing topographies of the target behavior (Figure 7).

Figure 5

Example of Introduction Target Behavior Slide

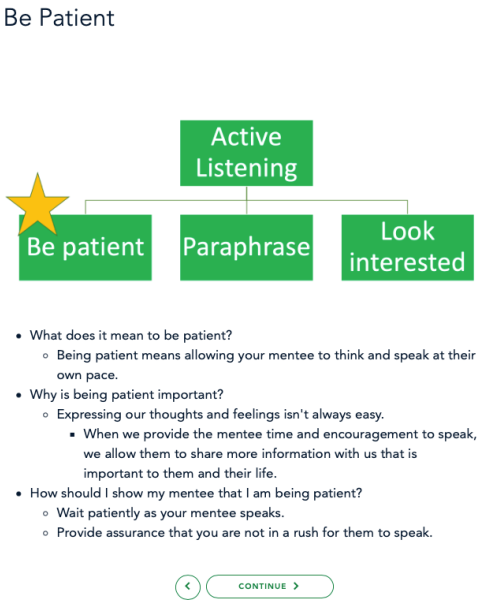


Figure 6

Example of Considerations Slide

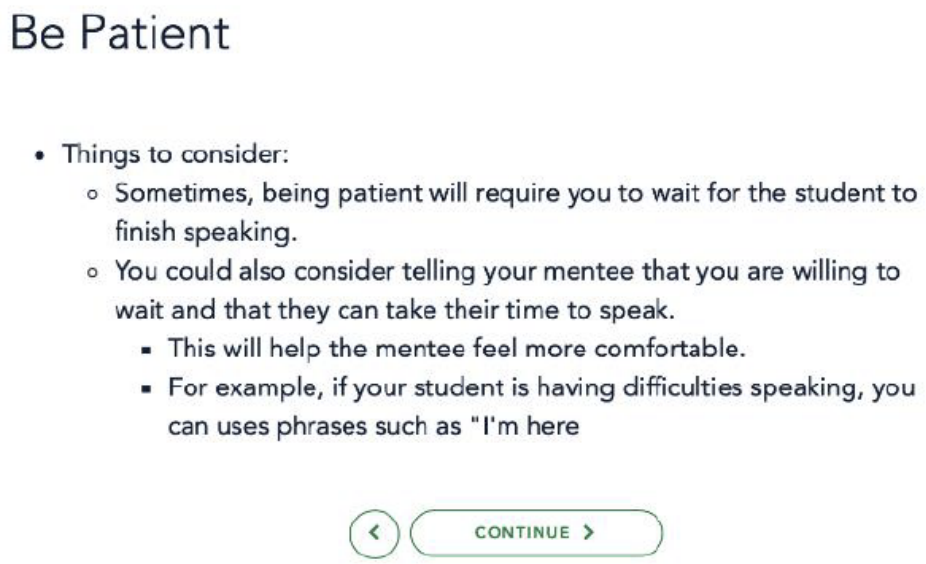


Figure 7

Example of Common Situations Slide

Common situations*:	Examples of what a mentee might say:	Example responses of what a peer mentor might say:
Your mentee loses their train of thought.	"I forgot what I was going to say..."	"No problem, I'll give you some time to try to remember."
Your mentee is having trouble expressing an idea, or their feelings.	"Hold on, I need to find the words to say what I want to say."	"Of course, take your time."
Your mentee stutters while speaking.	Your mentee struggles pronouncing words that start with "S".	Wait patiently for mentee to finish their response.

Note. Common situations referred to situations in which the target behavior should occur. Examples of mentee responses were provided to show examples of antecedent stimuli that may serve as an occasion in which to emit a response. Examples of target behavior topographies were also provided.

Teaching through Examples-and-Nonexamples

The next section of the instruction was the teaching through examples-and-nonexamples. The participant was provided with the following instructions:

> In the following activity, the numbers show you the order of the conversation sequence. We will go through three example and nonexample pairs. The example will show the target behavior performed correctly in the situation. It will show what you should do. The nonexample will show the target behavior performed incorrectly in the situation. It will show what you should not do.

Figure 8 shows an example-and-nonexample pair that was used to teach the be patient target behavior. Three example-and-nonexample pairs were provided for each target behavior, each pair displayed the same mentee-mentor scenario, and the example was always presented before the nonexample. The description of the scenario provided the relevant antecedent (e.g., mentee forgets what they were going to say), an example or nonexample of the target behavior (e.g., you let the mentee know that they can take their time to remember what they were saying), and the conclusion of the interaction (e.g., mentee remembers the topic of the lecture and tells you about it). The relevant antecedent and target behavior were presented in bold in the example whereas the nonexample behavior and the conclusion of the interaction were presented in bold on the nonexample slide.

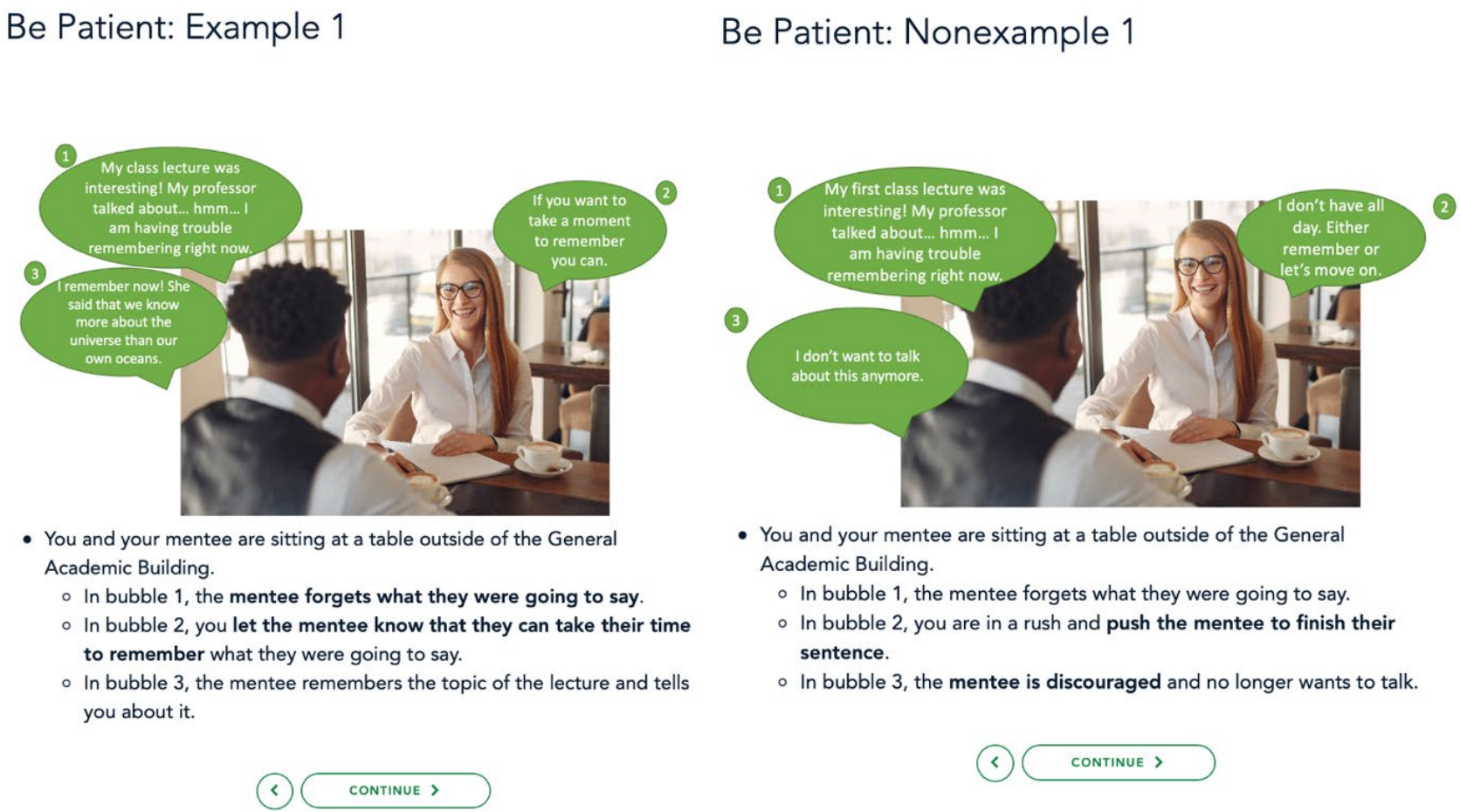
Discrimination Training

Discrimination training followed the three example-and-nonexample pairs. The participants were provided with the following instructions:

> Please read the scenario of a peer mentor and mentee interaction. Select whether the scenario is an example of (e.g., be patient), or a nonexample of (e.g., be patient). Remember that that the example will show the target behavior performed correctly in the situation and the nonexample will show the target behavior performed incorrectly in the situation.

Figure 8

Example of Teaching Through-Examples-and-Nonexamples Slide

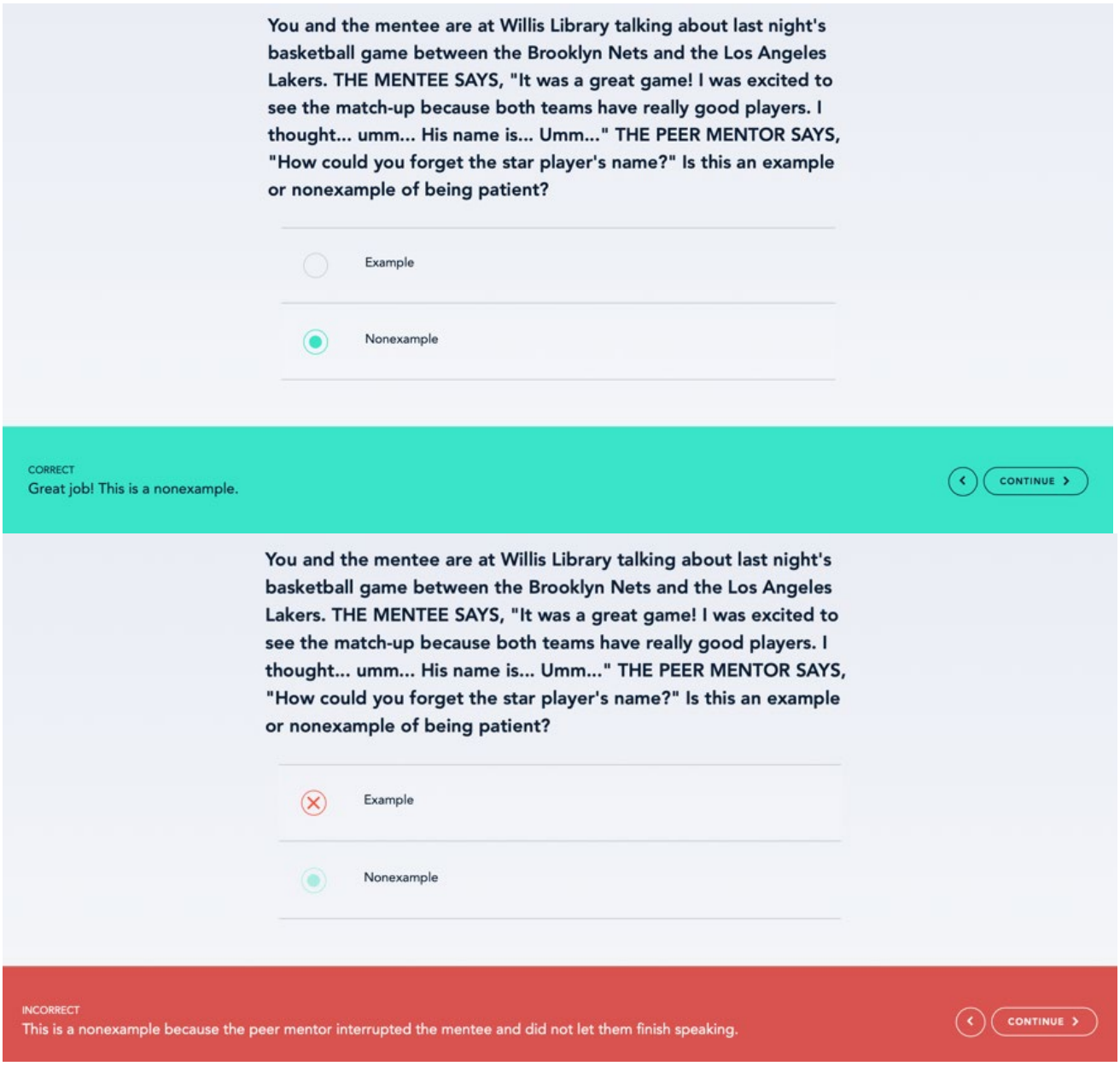


Note. Left panel shows an example slide and the right panel shows a nonexample slide.

The discrimination training was designed as a conditional discrimination procedure. Discrimination training contained three scenario questions that were written similarly to the pre- and posttest questions (Figure 9), but they did not include pictures and the dialogue tag was presented using capital letters (e.g., THE MENTEE SAYS). In discrimination training, the scenario question functioned as a conditional stimulus. At the end of the scenario, participants were provided with the question "Is this an example or nonexample of (e.g., be patient)?" Participants were required to select whether the scenario displayed was an example or nonexample of the target behavior (i.e., using the computer mouse to select one of two response options on the screen). Whether the example or nonexample manipulanda (i.e., the button) functioned as an S+ or S- depended on the scenario question. Depending on the conditional stimulus, an S+ was the stimulus correlated with reinforcement whereas S- was the stimulus correlated with extinction (Saunders & Williams, 1998). The participant received immediate feedback after their response (see Figure 9; Jaehnig & Miller, 2007; Johnson & Rubin, 2011). Selection of the correct response changed the color of the correct answer button from green to teal and presented a teal box below the answer choices with the following message: "Correct. Great job! This is (e.g., a nonexample)." (Figure 9, top panel). Selection of the incorrect answer changed the color of the correct answer button to teal, produced a red 'X' within the incorrect answer button, displayed a red box below the answer choices that stated "Incorrect," and described why the other answer was correct (e.g., This is a nonexample because the peer mentor forced the mentee to talk; Figure 9, bottom panel). The participant progressed through the discrimination training regardless of whether they responded correctly to a question. Amy and Morgan correctly answered 100% of the discrimination training questions ($N = 45$).

Figure 9

Example of a Discrimination Training Question and Feedback Provided After a Response



Note. Example from be patient target behavior discrimination training. Top panel shows feedback provided for correct responses. Bottom panel shows feedback for incorrect responses.

Social Validity

The participants' satisfaction with the CBI training module was evaluated within two weeks following the completion of the training. The survey was adapted from Hamilton et al.

(2016) and contained 5 questions (Table 4). The survey was administered using Qualtrics™ and links to the survey were sent out to the participants. Participants were asked to rate how much they agree with the statements presented on a scale of 1 (*strongly disagree*) to 5 (*strongly agree*). Participants strongly agreed that the training content was directly related to the training objectives and that they would apply what they learned in their role as a peer mentor. Participants either agreed or strongly agreed that the training objectives were clearly defined, the training content was clearly written and easy to use, and the online platform was appropriate and provided a good learning environment.

Table 4

Social Validity Survey Questions and Results

Statement	*M (Range)*
Training objectives were clearly defined.	4.5 (4 - 5)
The training content was directly relevant to the training objectives.	5
The training content was clearly written and easy to use.	4.5 (4 - 5)
If I was to be a peer mentor again, I would apply much of what I learned to my role.	5
The online platform was appropriate and provided a good learning environment.	4.5 (4 - 5)

Note. Ranges are reported in parentheses. Participant were asked to rate how much they agreed with each statement using 5-point Likert Scale from 1 (*strongly disagree*) to 5 (*strongly agree)*. Adapted from Hamilton et al. (2016).

CHAPTER 3

RESULTS

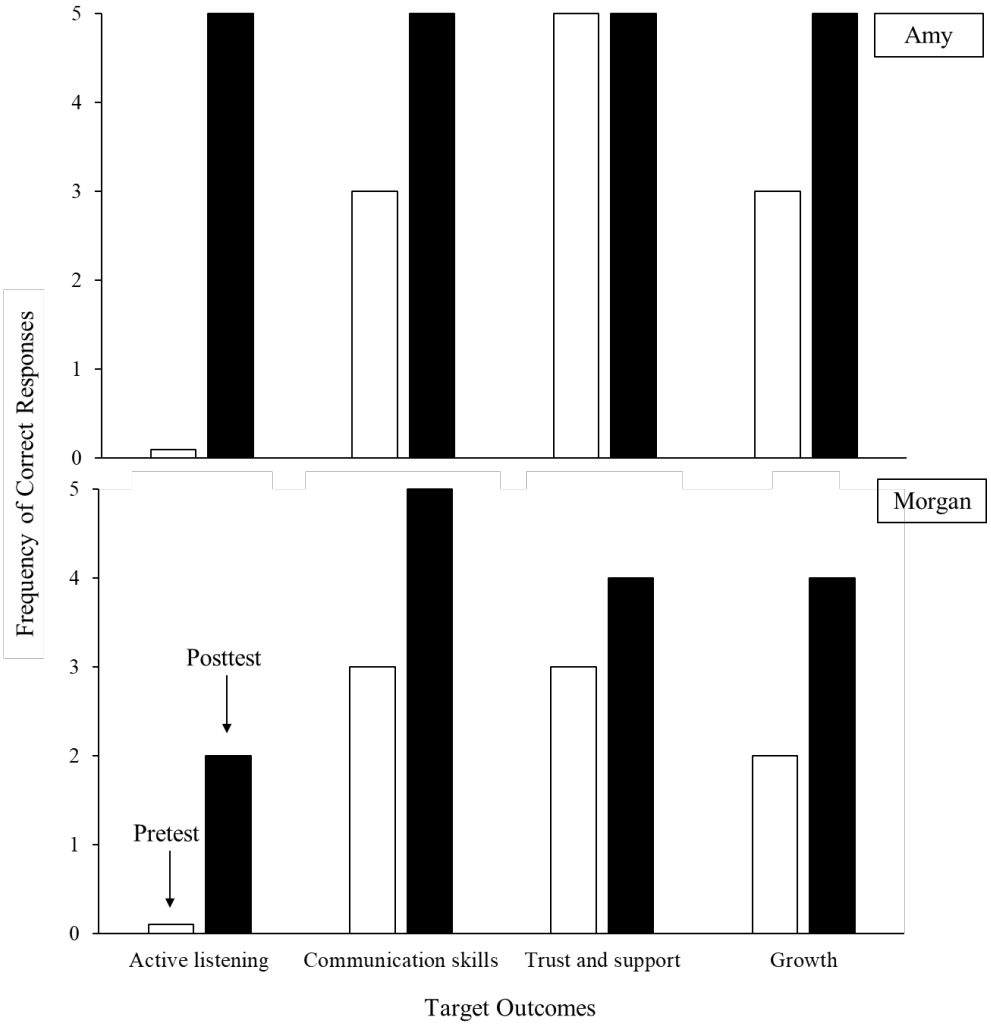
Figure 10 shows the frequency of correct responses in the submodule pretests and posttests for both participants. A maximum of five correct responses could occur in each pretest and posttest. Amy (Figure 10, top panel) emitted more correct responses on the posttests than the pretests across three of four submodules (i.e., active listening, communication skills, and growth). The largest increase in the number of correct responses was five correct responses on the active-listening posttest compared to zero on the pretest. Amy emitted three correct responses in both the communication-skills and growth submodule pretests but emitted five correct responses on both posttests. No change was observed in the trust-and-support submodule as Amy emitted five correct responses on both the pretest and posttest. Morgan (Figure 10, bottom panel) emitted more correct responses in each submodule posttest compared to the pretest. The largest increase in correct responding (i.e., an increase of two correct responses) occurred in the active-listening, communication-skills, and growth submodule posttests compared to their respective pretests. Morgan emitted three correct responses in the trust-and-support submodule pretest and emitted four correct responses on the posttest.

Figure 11 shows the frequency of target behaviors (e.g., asking open-ended questions in the communication-skills submodule), target behaviors from other target outcomes (i.e., referred to as other behaviors; e.g., having fun in the communication-skills submodule), and behaviors to avoid (e.g., pushing a mentee to change) that occurred on the pretest and posttest for each submodule for Amy (left) and Morgan (right). In the active-listening submodule (Figure 11, left, first panel), Amy emitted more target behaviors, emitted the same number of other behaviors, and emitted fewer behaviors to avoid in the posttest compared to the pretest. In the

communication-skill submodule (Figure 11, left, second panel), Amy emitted more target behaviors, emitted fewer other target behaviors, and emitted fewer behaviors to avoid in the posttest compared to the pretest.

Figure 10

Amy and Morgan's Frequency of Correct Responses Across Submodule Pretests and Posttests



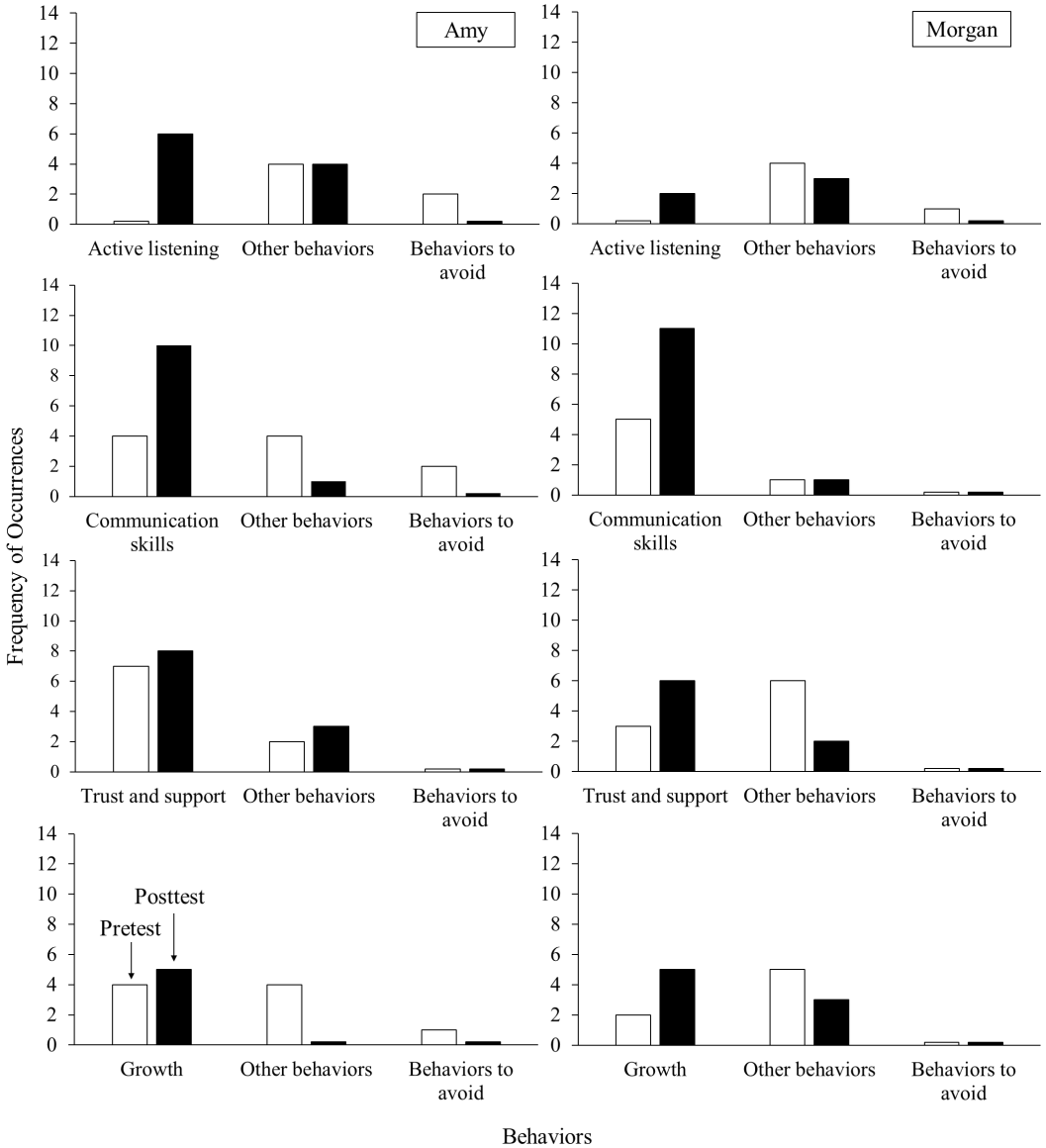
Note. The maximum number of correct responses per section was five. Amy's data are in the upper panel, and Morgan's data are in the lower panel.

In the trust-and-support submodule (Figure 11, left, third panel), Amy emitted more target behaviors, emitted more other behaviors, and did not emit any of the behaviors to avoid in the posttest compared to the pretest.In the growth submodule (Figure 11, left, fourth panel), Amy

emitted more target behaviors, emitted fewer other behaviors, and emitted fewer behaviors to avoid in the posttest compared to the pretest. Amy emitted more target behaviors in the posttests for all submodules, but the greatest change occurred on the active-listening and communication-skills posttests.

Figure 11

Frequency of Behaviors Emitted Across Submodule Pretests and Posttests for Amy and Morgan



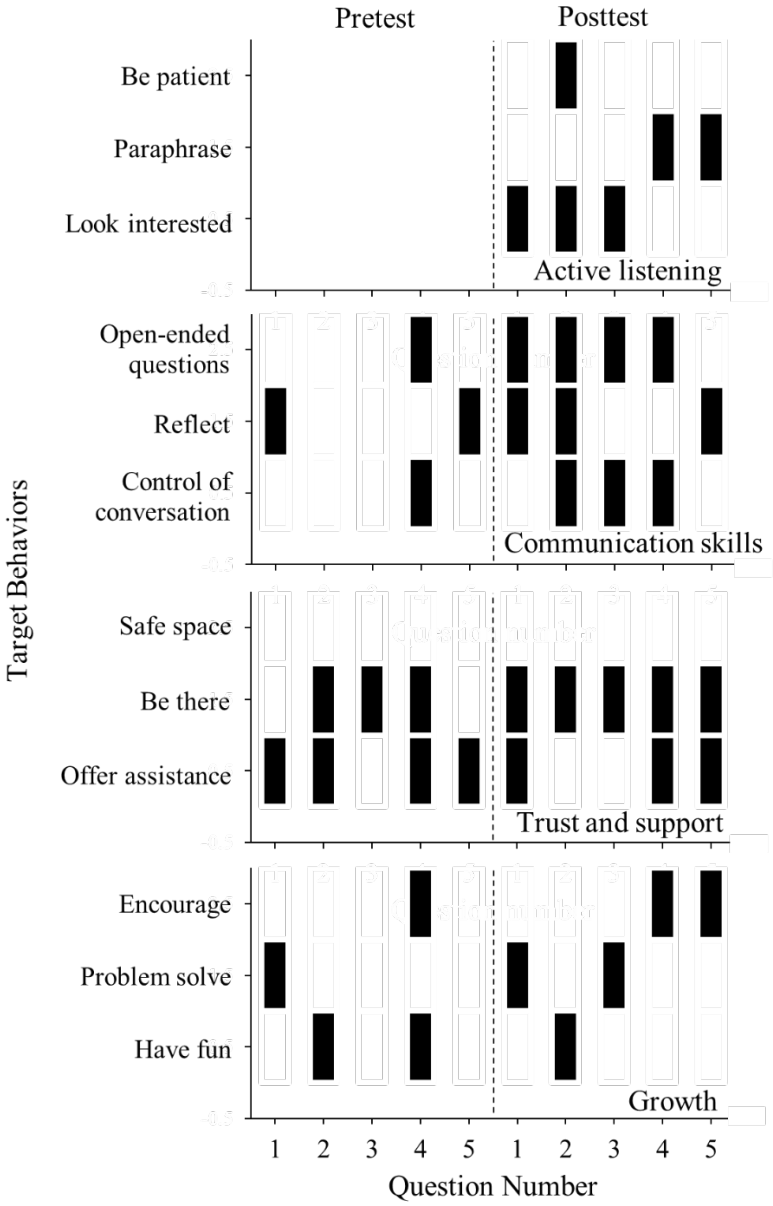
Note. On each graph, the target outcome (e.g., active listening) is used to represent the target behaviors taught within the submodule. The label "Other behaviors" refers to target behaviors that were not taught within the submodule. Behaviors to avoid were not targeted.

In the active-listening submodule (Figure 11, right, first panel), Morgan emitted more target behaviors, emitted fewer other behaviors, and emitted fewer behaviors to avoid in the posttest compared to the pretest. In the communication-skills submodule (Figure 11, right, second panel), Morgan emitted more target behaviors, emitted the same number of the other behaviors, and did not emit any of the behaviors to avoid in the posttest compared to the pretest. In the trust-and-support submodule (Figure 11, right, third panel), Morgan emitted more target behaviors, emitted fewer other behaviors, and did not emit any of the behaviors to avoid in the posttest compared to the pretest. In the growth submodule (Figure 11, right, fourth panel), Morgan emitted more target behaviors, emitted fewer other behaviors, and did not emit any of the behaviors to avoid in the posttest compared to the pretest. Morgan emitted more target behaviors in the posttest for all submodules, but the greatest change was in the communication-skills posttest.

Figure 12 shows the specific target behaviors Amy emitted on each question of the pretest and posttest across submodules (i.e., active listening, communication skills, trust and support, and growth). The first panel shows the target behaviors in the active-listening submodule (i.e., be patient, paraphrase, and look interested). In the active-listening pretest, Amy did not engage in any of the target behaviors. In the active-listening posttest, Amy emitted each target behavior at least once, and she emitted multiple target behaviors (i.e., be patient and look interested) on Question 2. The second panel shows the target behaviors in the communication-skills submodule (i.e., open-ended questions, reflect, and control of conversation). In the communication-skills pretest, Amy emitted each target behavior at least once, she emitted two target behaviors on Question 4 (i.e., open-ended question and control of conversation), and she did not engage in any target behaviors on Questions 2 and 3.

Figure 12

Scatter Plot Showing Occurrence of Target Behaviors Across Submodule Pretests and Posttests for Amy



Note. Each box represents the occurrence of the behavior. Posttest questions are arranged along the x-axis to match the pretest rather than the order used in the training.

In the communication-skills posttest, Amy engaged in all three target behaviors, and she emitted multiple target behaviors on four of the five questions including emitting all three target behaviors for one question. Specifically, she asked open-ended questions, reflected, and allowed

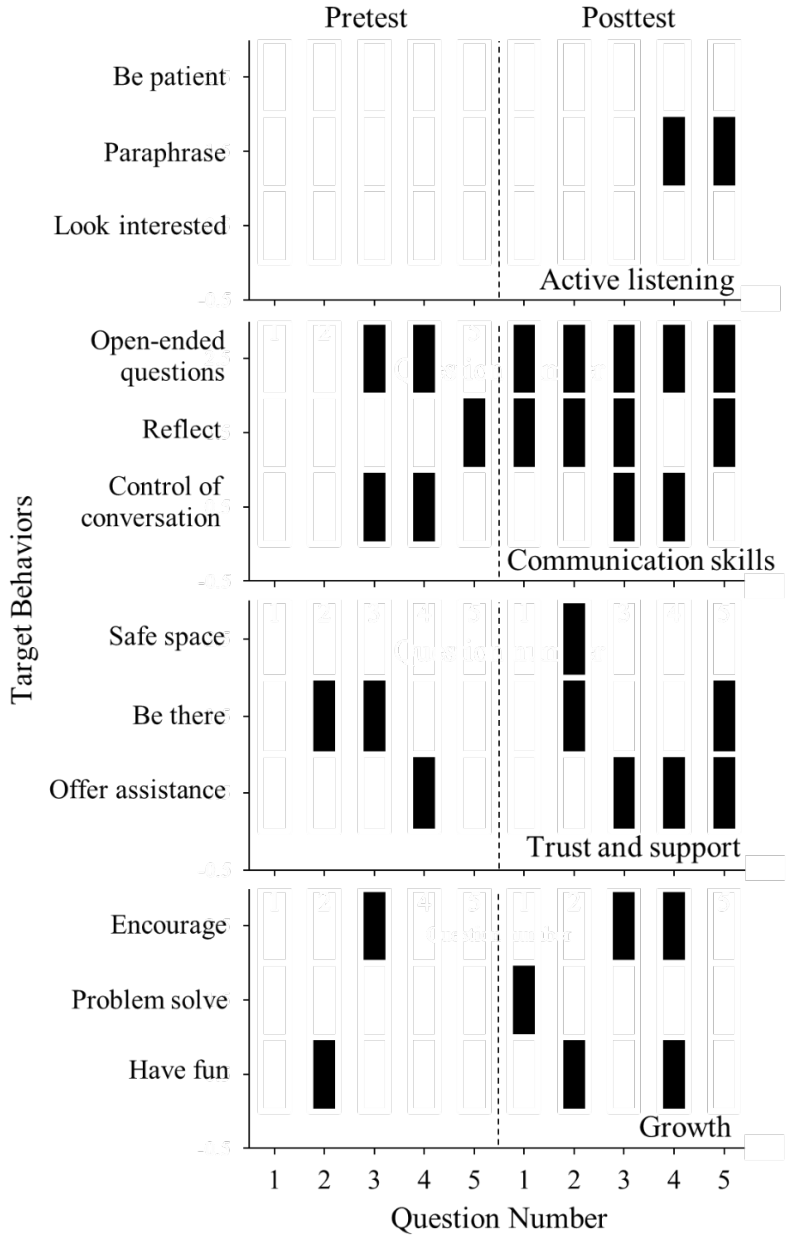
the mentee to control the conversation on Question 2. The third panel shows the target behaviors in the trust-and-support submodule (i.e., safe space, be there, and offer assistance). In the trust-and-support pretest, Amy emitted two out of three target behaviors (i.e., be there and offer assistance) at least once with two target behaviors occurring on Questions 2 and 4. In the trust-and-support posttest, Amy emitted the same two target behaviors (i.e., be there and offer assistance) with both occurring on Questions 1, 4, and 5. Amy never emitted the safe space target behavior. The fourth panel shows the target behaviors in the growth submodule (i.e., encourage, problem solve, and have fun). In the growth submodule pretest, Amy emitted each target behavior (i.e., encourage, problem solve, and have fun) at least once, she emitted two target behaviors on Question 4 (i.e., encourage and have fun), and she did not emit any target behaviors on Questions 3 and 5. In the growth posttest, Amy emitted a target behavior on each question, engaged in at least one instance of each target behavior, and did not emit multiple target behaviors on any questions.

Figure 13 shows the specific target behaviors Morgan emitted on each question of the pretest and posttest across submodules (i.e., active listening, communication skills, trust and support, and growth). The first panel shows the target behaviors in the active-listening submodule (i.e., be patient, paraphrase, and look interested). In the active-listening pretest, Morgan did not engage in any of the target behaviors. In the active-listening posttest, Morgan emitted one target behavior (i.e., paraphrase) on Questions 4 and 5, and they did not emit any other target behaviors. The second panel shows the target behaviors in the communication-skills submodule (i.e., open-ended questions, reflecting, and control of conversation). In the communication-skills pretest, Morgan emitted each target behavior at least once, they emitted two target behaviors occurring on Questions 3 and 4 (i.e., open-ended questions and control of

conversation), and they did not engage in any target behaviors on Questions 1 and 2. In the communication-skills posttest, Morgan engaged in all three target behaviors, and they emitted multiple target behaviors on all five questions including emitting all three target behaviors for one question. Specifically, they asked open-ended questions, reflected, and allowed the mentee to control the conversation on Question 3. The third panel shows the target behaviors in the trust-and-support submodule (i.e., safe space, be there, and offer assistance). In the trust-and-support pretest, Morgan emitted two out of three target behaviors (i.e., be there and offer assistance) at least once, and they did not engage in any target behaviors on Questions 1 and 5. In the trust-and support posttest, Morgan emitted all three target behaviors (i.e., safe space, be there, and offer assistance) at least once, and they emitted multiple target behaviors in two out of five questions. On Question 2, Morgan offered to provide a safe space and assurance that they would be there for the mentee. This was the only instance of the safe space target behavior. On Question 5, Morgan provided assurance that they would be there for the mentee and offered to provide assistance. The fourth panel shows the target behaviors in the growth submodule (i.e., encourage, problem solve, and have fun). In the growth submodule pretest, Morgan emitted two out of three target behaviors once (i.e., encourage and have fun), and they did not emit any target behaviors on Questions 1, 4, and 5. In the growth posttest, Morgan emitted each target behavior (i.e., encourage, problem solve, and have fun) at least once, and they emitted multiple target behaviors on one out of five questions. Specifically, Morgan offered encouragement and emitted a have fun behavior.

Figure 13

Scatter Plot Showing Occurrence of Target Behaviors Across Submodule Pretests and Posttests for Morgan



Note. Each box represents the occurrence of the behavior. Posttest questions are arranged along the x-axis to match the pretest rather than the order used in the training.

CHAPTER 4

DISCUSSION

The result of this study suggests that a CBI training program that included teaching through examples-and-nonexamples and discrimination training increased the occurrence of target behaviors when participants emitted typed responses to scenario questions. With the exception of the active-listening submodule, both participants emitted some correct responses on the pretests, and correct responses increased for seven of the eight submodules across participants. Amy emitted more correct responses in three out of four submodule posttests compared to their pretests (i.e., active listening, communication skills, and growth); she emitted the correct responses on the trust-and-support submodule prior to training. Morgan emitted more correct responses in each submodule posttest compared to the corresponding pretest (i.e., active listening, communication skills, trust and support, and growth). Increased correct responding on the posttests may have been due the CBI training module teaching participants the conditions under which the target behaviors should occur. That is, other than active-listening responses, both participants emitted some of the submodule target behaviors at some level in the pretests (see Figure 12 and Figure 13). The improvements in the participants responses may be attributed to bringing the participants' behavior under stimulus control. Stimulus control is said to have occurred when behavior occurs more often in the presence of a stimulus than in its absence (Saunders & Williams, 1998). The CBI training program may have increased the probability that participants emitted the target behaviors under the relevant conditions (i.e., the scenario questions).

An increase in the frequency of target behaviors and a decrease in other behaviors were observed for both participants across most submodules (see Figure 11). Additionally, an analysis

of the occurrence of each target behavior (e.g., open-ended questions, reflect, and control of conversation) emitted on each question of a submodule pretest and posttest (e.g., communication skills) showed an increase in the number of target behaviors emitted per question in the posttests (see Figure 12 and Figure 13). These results may be explained via multiple control—specifically convergent and divergent multiple control (Michael et al., 2011).

Convergent multiple control may have contributed to the increase in frequency of each target behavior across each submodule and a decrease in other behaviors in five out of eight submodule posttests (see Figure 11). Convergent multiple control refers to instances in which multiple variables strengthen one response (Michael et al., 2011). Each pretest and posttest scenario question contained two variables: a description a hypothetical mentee-mentor scenario and a question asking participants how they would demonstrate the target outcome (e.g., communication skills) given the scenario. The combined effects of these two variables may have made the participants more likely to emit the target behaviors and less likely to emit other behaviors. Future research could investigate if presenting a question that does not explicitly state the target outcome produces similar results (e.g., how would you respond in this situation?).

Divergent multiple control may have contributed to an increase in the occurrence of multiple target behaviors in response to a single scenario question in three out of four submodules for both participants (see Figure 12 and Figure 13). Divergent multiple control refers to instances in which a single variable strengthens multiple responses (Michael et al., 2011). Participants were not provided with explicit instructions to emit target behaviors in combination. Thus, overlap in the elements of the scenarios (i.e., the location or activity, the contextual information provided about the scenario, and the mentee statement) used during instruction may have made it more likely that component behaviors be emitted in combination in the pretests and

posttests. Future research could investigate the effects of explicit instructions to emit multiple target behaviors has on the number of target behaviors emitted per question in the posttests.

Together, the instructional package (i.e., introducing target behaviors, considerations, and common situations in which the target behavior may be emitted), teaching target behaviors through examples-and-nonexamples and discrimination training increased correct responding on seven out of eight submodule posttests across both participants. We used the three instructional strategies across all submodules and did not evaluate the efficacy of each component separately. Future research may consider conducting a component analysis, which could aid in efficiency if only one component is necessary to produce change in the emission of the target behaviors.

Teaching through examples-and-nonexamples and discrimination training were incorporated into the CBI training module to teach participants the target behaviors and the conditions under which they should occur. The relationship between target behaviors and the conditions in which they should occur were taught as "examples" to promote the emission of the response when presented with novel examples. Participants were presented with multiple examples of antecedent stimuli (i.e., descriptions of hypothetical mentee-mentor situations that may occur in mentoring session) and examples and nonexamples of target behaviors to try to promote the occurrence of the target behaviors outside of the training context (Stokes & Baer, 1977). The use of discrimination training with examples and nonexamples incorporated a requirement to actively respond to the instruction materials—a best practice guideline in CBI (Johnson & Rubin, 2011)—and this could have helped responses come under the control of relevant features of the example (Johnson & Layng, 1994).

The behavioral mechanism responsible for the effects of discrimination training is differential reinforcement. Differential reinforcement involves providing reinforcement for

responding in the presence of the S^D (i.e., stimulus correlated with the availability of reinforcement) and withholding reinforcement for responding in the presence of the S^Δ (i.e., stimulus correlated with the unavailability of reinforcement; Cooper et al., 2020). Discrimination training can involve contingencies (i.e., if-then statement that describes the relationship between an antecedent, behavior, and consequence; Cooper et al., 2020) with three or more terms. For example, in the presence of a red light (i.e., antecedent), the rat presses a lever (i.e., behavior), and produces food (i.e., consequence). However, pressing the lever in the presence of a green light will not produce food (i.e., extinction). The discrimination training used in this CBI training program involved a four-term contingency (i.e., conditional discrimination). A four-term contingency includes a conditional stimulus into a three-term contingency and the stimulus correlated with reinforcement depends on the conditional stimulus (Saunders & Williams, 1998). Using the same three-term contingency example as above, in the presence of a 120 beats per-min tone (i.e., conditional stimulus), a rat pressing a lever in the presence of a red light produces food, whereas pressing the lever in the presence of a green light does not. However, in the presence of a 30 beat per-min tone, the contingencies are reversed (i.e., green light is correlated with food and red light is correlated with extinction). In the discrimination training, the scenario question was the conditional stimulus that determined whether the example or nonexample stimulus served as the S+ (i.e., stimulus correlated with reinforcement) or S- (i.e., stimulus correlated with extinction). That is, whether selecting "example" would be reinforced was dependent on which scenario was presented as an antecedent. For example, if the growth scenario included the peer mentor saying, "I know that you can succeed if you try!", then selecting "example" would produce praise. However, if the growth scenario included the peer mentor saying, "It doesn't matter how hard you try.", then selecting "nonexample" would

produce praise. Both participants responded correctly to 100% of the discrimination training questions across all submodules.

The results of this study suggest the CBI training module can increase the frequency of target behaviors emitted by peer mentors. However, the development of a high-quality mentee-mentor relationship entails peer-mentors emitting the target behaviors over the course of the relationship (Garringer & Jucovy, 2007; *Peer Mentoring Handbook*, n.d.) Thus, a limitation of the current investigation is that generalization of the target behaviors was not evaluated. Generalization refers to the occurrence of the target behaviors outside of the conditions in which they were trained without or with a reduced amount training (Stokes & Baer, 1977). It is unknown if the target behaviors taught through this training program would occur outside of the context of the training (i.e., during a real mentee-mentor interaction). Future research should evaluate the generalization of the target behaviors taught using this CBI training module by conducting generalization probes of participant interactions with mentees following training. The current study assessed responding in the presence of hypothetical scenarios and did not assess responding with mentors under simulated or natural conversations. A description of target behaviors, or lack thereof, does not necessarily reflect the participant's skills prior to or following training. Future research should assess the participant's responding using methods that more closely approximate social interactions that occur in person because it would allow participants to demonstrate the target behaviors instead of describing them using typed words. This could be done by incorporating role-play scenarios that simulate mentee-mentor interactions and instructing the participant to respond as if they were speaking to a mentee. If the findings suggest that this CBI training program does not produce generalization, future research could incorporate strategies that produce generalization such as incorporating opportunities to practice

engaging in the target behaviors while speaking with others (i.e., another peer mentor, or a mentee) following each submodule (Custer et al., 2021). This method would allow the target behaviors to come under the control of simulated or actual mentee-mentor interactions (Stokes & Baer, 1977).

Another limitation of this study is that agreement between data collectors was low on measures (Table 3). Average IOA was at or above 80% for each step of the coding system with one exception (i.e., 60% agreement on other outcomes in Morgan's responses in the growth submodule posttest), and the minimums reported within the ranges may cause some concern (e.g., 0% agreement, 33% agreement, 67% agreement). Item-by-item IOA was selected to avoid overestimating the agreement between two observers. Thus, IOA was evaluated on a question-by-question basis to assess agreement on the occurrence and nonoccurrence of target outcomes, target behaviors, and behaviors to avoid. The results of the IOA calculations indicated that there may be some subjectivity in the target behaviors' operational definitions that may have affected the coder's responses.

Although this CBI training module increased the frequency of correct responses, this training program did not incorporate all effective training strategies. The inclusion of a mastery criterion to progress through a CBI training program was found to produce better training outcomes (Johnson & Rubin, 2011). We did not include a mastery criterion to progress through the discrimination training because of technological constraints (i.e., Bridge© did not have a customizable setting that allowed researchers to set a mastery criterion). The two participants in this study answered 100% of questions correctly, so a mastery criterion may not have made a difference in their responding. However, it may be an important component to include because other participants may not replicate the same pattern of responding that was observed with the

two participants. Another effective teaching strategy is behavioral skills training (BST). BST is a training method that uses instructions, modeling, rehearsal, and feedback (Sarokoff & Sturmey, 2004) and has been used to teach a variety of skills (DiGennaro Reed & Henley, 2015; Parsons & Rollyson, 2012). This method may be well-suited for teaching the target behavior that may contribute to a higher-quality mentee-mentor relationship because it would allow participants to practice the skills and receive feedback on their performance in an environment that more closely simulates the natural environment and could come under the control of the natural maintaining contingencies which would improve generalization and maintenance of the behavior (Stokes & Baer, 1977). Using a BST training program may address another limitation of this study. The safe space target behavior only occurred once across both participants, and substantial improvements were not made by Morgan in the active-listening submodule posttest (i.e., only one target behavior was emitted on two questions). These data may suggest that the CBI training program did not effectively program opportunities for the component behaviors to occur in the pre- and posttests or was not effective at teaching the safe space and active-listening component behaviors. A BST training program more closely resembles in-person interactions and may be better suited for teaching peer-mentors to provide a safe space to their mentees and to emit the component skills related to active listening.

Overall, this study potentially makes two contributions. First, it provides target behaviors and operational definitions that may contribute to a better relationship between a mentee and mentor. Many of the component behaviors that could potentially contribute to a higher-quality relationships between a mentee and a peer-mentor are subjective and difficult to operationally define. Wolf (1978) recognized the challenge in predicting the social validity of component behaviors that share a subjective label. One of the ways to investigate the relationship between

subjective labels and their related component behaviors is to ask the consumers (Wolf, 1978). A recent example of this is Taylor et al. (2019) wherein the authors conducted a survey on compassionate care and behaviors that support or impede quality therapeutic relationships with parents of children with ASD ($N = 95$). Taylor et al. found that asking open-ended questions, looking interested, paraphrasing, reflecting, allowing openness and honesty without criticism (i.e., safe space), and providing encouragement were ranked highly by parents. The authors used their survey results to develop operational definitions and a curriculum to teach behavior analysts the component skills that may improve the therapeutic relationship with their client's caregivers. Similarly, this study used a similar approach to identify the target behaviors to include in this study. Five mentees completed the survey and rated each behavior based on how much they believed the peer-mentor behavior would contribute to the development of a good relationship. The three highest rated component behaviors from each target outcome (i.e., active listening, communication skills, trust and support, and growth) were operationally defined and included in the CBI training module. Future research could refine the operational definitions and the measurement of the component behaviors identified in this study. A limitation is that the social validity survey may not have included all component behaviors that may improve mentee-mentor relationships or included more than are necessary to produce improvements in the relationship. Future research could continue to find and evaluate which component behaviors are socially valid and are necessary and sufficient to produce improvements in mentee-mentor relationships.

Second, it shows that teaching through examples-and-nonexamples and discrimination training can increase the frequency of target behaviors in participant's typed responses to scenario questions. There is a paucity in research in literature regarding how to train peer mentors working with college students with ASD (Hamilton et al., 2016). This study provides

one method that can be adopted by peer-mentoring programs that aim to teach peer mentors the component behaviors that may contribute to higher-quality relationships with their mentees. However, only two participants completed the study which limits the generality of the findings. Future research should assess the external validity of the CBI training program by attempting to replicate the results of this study with additional peer mentors.

APPENDIX A

COMPONENT BEHAVIORS RELATED TO EACH OUTCOME

Outcome	Behavior
Trust and Support	Offering assistance
	Provide assurance of a safe space
	Providing assurance that you will be there for them
	If advice is given, help identify a solution
	Give advice sparingly
	Sound like a friend, not like a parent
	Let you set your own goals, instead of giving you goals
Communication skills	Asking open-ended questions
	Respond in ways that shows you see the mentee's side of things
	Reciprocal conversations
	Allowing mentee to have a lot of control in direction of the conversation
Active listening	Being patient with you
	Paraphrasing what the mentee has said
	Using appropriate gestures/body language to show you are listening
Growth	Provide opportunities to allow mentee to solve problems
	Allow mentee to have choices in deciding activities
	Engage in fun activities and conversations
	Provide words of encouragement
	Explore mentee's interest in depth

Note. A social validity survey was administered with the mentee's participating in the peer- mentoring program, and the three highest ranked behaviors from each target outcome were included in the training and operationally defined.

APPENDIX B

QUESTIONS FROM SOCIAL VALIDITY OF COMPONENT BEHAVIORS SURVEY

1. How much support would you feel if your peer mentor offered to help?

2. How much support would you feel if your peer mentor said they are there to help you?

3. How much support would you feel if a peer mentor helped you find answers when you identified a problem?

4. How much support would you feel if a peer mentor gave you advice when you ask?

5. How much support would you feel if your peer mentor talked to you like a friend, instead of a parent?

6. How much support would you feel if your peer mentor let you set your own goals, instead of giving you goals?

7. How much would a peer mentor asking about your thoughts and opinions add to creating a good line of communication, instead of asking "yes" or "no" questions?

8. How much would a peer mentor looking at things from your perspective add to creating a good line of communication?

9. How much would a peer mentor allowing a back-and-forth conversation add to creating a good line of communication?

10. How much would a peer mentor allowing you to lead the conversation add to creating a good line of communication?

11. How much would a peer mentor being patient with you add to creating a good line of communication?

12. How much would a peer mentor summarizing what you say help you feel heard or listened to?

13. How much would a peer mentor looking interested in what you have to say help you feel heard or listened to?

14. How much would a peer mentor giving you a chance to problem solve help you grow as a member of the community?

15. How much would a peer mentor allowing you to decide what both of you do during hangouts help you grow as a member of the community?

16. How much would a peer mentor being fun and enjoyable to be around help you grow as a member of the community?

17. How much would a peer mentor providing encouragement help you grow as a member of the community?

18. How much would a peer mentor getting to know you and your life goals help you grow as a member of the community?

Note. Each question included a 5-point Likert scale from 0 (*nothing*) to 4 (*a lot*).

APPENDIX C

BUILDING RAPPORT AND CREATING MEANINGFUL INTERACTIONS TRAINING OBJECTIVES

After participating in the training, the peer mentor will:

1. Describe the target outcomes that contribute to building rapport and creating meaningful interactions.

2. Identify the target behaviors that make up the target outcomes.

3. Demonstrate the target behaviors that make up the target outcome when presented with a role play scenario under relevant conditions.

APPENDIX D

QUESTIONS USED ON THE PRETEST AND POSTTEST

Active listening

1. You and your mentee are in the Sage Hall lobby. Your mentee begins to tell you, “Lately, I have been having sleeping. Last night, I planned to go to sleep at 10 pm, but I fell asleep at 2 am. I don’t know why. I usually like to relax by watching YouTube videos, playing games on my phone, texting friends.” How would you demonstrate active listening in this situation?
2. You and your mentee are talking about family while having lunch at Bruceteria. Your mentee says, "I grew up in Dallas. I lived with my parents and my four siblings: Henry, Erick, Dan, Sofia, and I lived in the same house. It was a full house. But that was a good thing because there was never a dull moment. Now, Sofia, Erick and Henry have graduated college, and live on their own. Dan lives with the family and has just started high school. My relationship with him is interesting. We get along but I do get annoyed with him a lot. You know, typical little brother problems.” How would you demonstrate active listening in this situation?
3. You and your mentee are having your weekly check-in meeting via Zoom. You are about to ask the mentee about how their week went. Then, the mentee says, “I remember when I was 10 or 11 years-old. My friends and I went on a cool field trip! I joined the citizenship club because my friends were in it.” How would you demonstrate active listening in this situation?
4. You are sitting with your mentee in the waiting area outside of the Business Leadership Building. Your mentee says “I got into a big argument with a good friend from back home. Teachers in high school always said that high school friends grow apart over the years. It all started when I wanted to tell my friend about how cool college is. She decided that school wasn’t for her. She told me that all I do is talk about school and rub it in her face. It’s not that way at all. This really sucks.” How would you demonstrate active listening in this situation?
5. You and your mentee are having a conversation over the phone. Your mentee says “I really want to learn to play chess. The Queen’s Gambit is an awesome show. I didn’t think it would be so popular. I know the chess pieces are the… Rook… umm…… something else… the horse one is called… the steed?... Then there's the king and queen, of course. And the peasant and priest!” How would you demonstrate active listening in this situation?

Communication skills

1. You are with your mentee in the library. Your mentee tells you “I’ve always been a fan of classical literature.” How would you demonstrate communication skills in this situation?
2. You are with your mentee and they tell you “I just got a call from my parents. They want me to go home for the weekend. I am frustrated that they want me to go home so often. I want to stay here and get the full college experience.” How would you demonstrate communication skills in this situation?

3. You are having a conversation with your mentee about how their classes are going so far in the semester. Then, the mentee says “OMG! I heard that my favorite band is hosting a live stream! I’m excited!” How would you demonstrate communication skills in this situation?
4. You are hanging out with your mentee at chick-fil-a. You see that your mentee has a worried look on their face. They begin to tell you “I know I haven’t been here for long, but I am feeling overwhelmed.” How would you demonstrate communication skills in this situation?
5. You meet up with your mentee for coffee after class. Your mentee begins to tell you “I met a really cool classmate! We both like to watch musicals, but she doesn’t seem to be a fan of Hamilton which I think is crazy!” How you would you demonstrate communication skills in this situation?

Trust and support

1. You and your mentee are meeting at the General Education Building. Suddenly, your mentee starts to pace around the hallway. They look at you and say “my professors… my professors are the worst. They just keep pilling stuff on me!” How would you demonstrate trust and support in this situation?
2. Your mentee gives you a call on a Friday evening. Your mentee asks you, “Hey, can you do me a favor? I want to rearrange my room to make it more organized. I can’t move all the furniture by myself. Do you think you could help me?” How would you demonstrate trust and support in this situation?
3. You and your mentee are waiting outside of their physics class an hour before the start time. Your mentee says, “The person that sits next to me in class told me that their roommate said this class gets so much more difficult after the first 3 classes.” How would you demonstrate trust and support in this situation?
4. You are with your mentee walking passed the music building. Your mentee says, “I got an e-mail from my advisor. They told me to register for classes, but they did not tell us how.” How would you demonstrate trust and support in this situation?
5. Your mentee sends you a text message and says “I’m sorry to bother you. I have a situation that I would like some guidance on, but I’m a little embarrassed to ask.” How would you demonstrate trust and support in this situation?

Growth

1. You and your mentee are having your usual meeting via Zoom. Your mentee tells you “I am really worried about my grade on this assignment. If I don’t get an A, my parents will be upset with me.” How would you demonstrate growth in this situation?
2. You and your mentee are texting back and forth and decide to grab lunch after class. You meet your mentee by the parking lot by the Environmental Science Building. Your

mentee says, “l don’t remember where I parked me car.” How would you demonstrate growth in this situation?

3. You and your mentee are walking by Terrill Hall when your mentee says, “I made a friend in one of my classes that is really into tennis. He invited me to go play with him. I’ve never been good at sports though. What do I need to play?” How would you demonstrate growth in this situation?
4. You and your mentee are at the park in front of Maple Hall. Your mentee says “I have been enjoying my performing arts class. I am excited to give a live performance in class soon.” How would you demonstrate growth in this situation?
5. You are with your mentee walking by the Library Mall and the Union Building. You see announcements across campus that the Denton Jazz festival will be held on the weekend. Your mentee looks at you and says “I have never been to a festival before. I don’t usually have anyone that wants to go with me”. How would you demonstrate growth in this situation?

APPENDIX E

QUESTIONS USED FOR THE DISCRIMINATION TRAINING FOR EACH TARGET BEHAVIOR

Be patient

1. You and the mentee are at Willis Library talking about last night's basketball game between the Brooklyn Nets and the Los Angeles Lakers. THE MENTEE SAYS, "It was a great game! I was excited to see the match-up because both teams have really good players. I thought... umm... His name is... Umm..." THE PEER MENTOR SAYS, "How could you forget the star player's name?" Is this an example or nonexample of being patient?
2. The mentee calls you to talk about their recent progress on a goal. The mentee wants to make more friends within her class. SHE TELLS YOU, "I am... I am..." and goes quiet. THE PEER MENTOR SAYS, "Are you going to say something?" Is this an example or nonexample of being patient?
3. The MENTEE walks into the UNT CAN office and SAYS, "Hey, can I ask you something?" The PEER MENTOR SAYS, "Of course, what's going on?" THE MENTEE REPLIES, "I know what I want to ask but I need to think of how to say it better." THE PEER MENTOR SAYS, "Take your time, I'll be here when your ready." Is this an example or nonexample of being patient?

Paraphrase

1. You are talking with the mentee on a bench in Wooten Hall. THEY TELL YOU, “I was talking to my dad yesterday. He told me that his friend is a dog breeder and has puppies for sale. The dogs are a good breed which makes them a little pricey, but his friend is willing to give us a discount. I’ve always wanted a dog. I’m excited!” THE PEER MENTOR SAYS, “I see, your dad’s friend is giving you a good deal on the puppy and you are excited to get one, is that correct?” Is this an example or nonexample of paraphrasing?
2. You are with the mentee at a movie theatre. While waiting in line, THE MENTEE SAYS, “I heard rumors that they are introducing Mephisto into the Marvel Cinematic Universe. It’s an interesting twist that I did not expect.” THE PEER MENTOR SAYS, “did you hear the theatre employees mention that the movie next door is the best movie of the year?” Is this an example or nonexample of paraphrasing?
3. You are with the mentee on a walk through the park during your usual weekly meeting. YOUR MENTEE SAYS, “I am having relationship problems. My girlfriend and I got into a big fight recently. She says that I don’t spend enough time with her. I see her every day.” THE PEER MENTOR SAYS, “What I heard you say is that you and your girlfriend are fighting over how much time you spend together? I just want to make sure that I understand the situation.” Is this an example or nonexample of paraphrasing?

Look Interested

1. You are on a zoom call with the mentee. THEY TELL YOU “I really miss my parents. I’m not used to waking up every morning and not being able to say good morning to them.”

THE PEER MENTOR leans forward and faces the mentee while the mentee talks about a personal issue. Is this an example, or nonexample of looking interested?

2. You meet with the mentee over the weekend to see how they are doing. It starts to rain as you enter the residence hall. You tell the mentee that it was raining hard outside. THE MENTEE SAYS, “What’s crazy is that it rains like this in Seattle all the time. It feels like it rains every two weeks.” The peer mentor looks at the mentee's shoes. THE PEER MENTOR SAYS, “whoa, those are some nice shoes!” Is an example or nonexample of looking interested?
3. You are sitting next to the mentee on a bench at the Denton Square. THE MENTEE TELLS YOU, “I met a friend through my French class. We were considering going on a date this weekend. I was thinking about taking her to a great Thai spot in Carrollton. They have good food there." THE PEER MENTOR looks at the mentee in the eyes while the mentee is speaking. Is this an example or nonexample of looking interested?

Open-ended questions

1. You and the mentee are in the lobby of their residence hall. You notice that the mentee has a green backpack that looks like a Turtle shell. THE PEER MENTOR SAYS, “What do you think about the Teenage Mutant Ninja Turtles being named after famous artists?” Is this an example or nonexample of asking open-ended questions?
2. You are at the Pohl rec center playing indoor soccer with the mentee. The mentee’s phone rings because their sister is calling. Your mentee briefly talks to her sister before returning to the court. THE PEER MENTOR SAYS, “How would you describe your relationship with your sister?” Is this an example or non-example of asking an open-ended question?
3. You and the mentee are walking to New York Sub Hub for lunch. Once you and the mentee arrive and look at the menu, the mentee begins to panic and feel overwhelmed by the choices. THE MENTEE SAYS, “I really don’t know what to get.” THE PEER MENTOR SAYS, “Let’s see... Do you like Turkey?” Is this an example or nonexample of asking open-ended questions?

Reflect

1. You are meeting with the mentee at Campus CHAT in the Union Building. They sit down next to you and you notice that the mentee looks confused and thrown off by something. THE MENTEE SAYS, “My professor’s study guide looked nothing like the test! I spent hours studying the wrong thing.” THE PEER MENTOR SAYS, “You should have studied the class material instead of the study guide.” Is this an example or nonexample of reflecting?

2. You and the mentee are meeting at their residence hall for a quick conversation before an interview. They are applying for a position with an on-campus student organization. THE MENTEE dressed in their best attire and SAYS, “This interview will be different than other interviews that I’ve had in the past. I’ve worked hard to get to this point. I’m ready to take this next step.” THE PEER MENTOR SAYS, “You sound very confident and very prepared for this interview!” Is this an example, or nonexample of reflecting?
3. You are with the mentee at the Gateway Center. You are meeting up for your last weekly meeting of the semester. THE MENTEE TELLS YOU, “I just finished taking my last final! It’s winter break and I am ready to relax. But this also means that I won’t get to hang out with my friends since they are also going home.” THE PEER MENTOR SAYS, “It sounds like this experience is bittersweet, right? You are relieved to be done with school, but will miss your friends while your home?” Is this an example, or nonexample of reflecting?

Control of conversation

1. You are on a phone call with the mentee. The mentee told you the day before that they were excited to go to a concert with their friend. You ask the mentee if they enjoyed the concert. THE MENTEE RESPONDS BY SAYING, “I discovered a really cool board game earlier today!” THE PEER MENTOR SAYS, “Did the band you went to see play some good songs?” Is this an example or nonexample of control of conversation?
2. You are with the mentee at the annual Christmas tree lighting on the Denton Square. YOU ASK THE MENTEE, “Have you ever been to a festival like this?” The mentee moves to a table 5 feet away and drinks a cup of Wassail. YOUR MENTEE SAYS, “Yo, this is good! Have you ever had it before?” THE PEER MENTOR SAYS, “I had it for the first-time last year and I instantly loved it.” Is this an example or nonexample of control of conversation?
3. While speaking on the phone with the mentee, THE MENTEE ASKS YOU, “I want to upgrade my wardrobe to something more fashion-forward. There’s something about the aesthetic that I just dig. What do you think about it?” THE PEER MENTOR SAYS, “I don’t really know what is considered fashion forward is. Can you describe it to me, please? I’m sure you can find some good stores at the Grapevine Mall.” Is this an example or nonexample of control of conversation?

Safe space

1. You are hanging out with the mentee at Starbucks. While you are taking a sip of your coffee. THE MENTEE SAYS, “I’m in a little bit of a dilemma. I don’t know how to handle it.” THE PEER MENTOR SAYS, “You can tell me anything, the last thing I’ll do is judge you in your time of need.” Is this an example or nonexample of safe space?

2. You are hanging out with your friends in your apartment. You hear the phone ring and see that it's a call from the mentee. You answer the phone and THE MENTEE TELLS YOU "Hey, I had a big argument with a friend last night. I am not sure if we can repair our friendship. Can we talk about it?" THE PEER MENTOR SAYS, "Yes! I want you to know that you can be open and honest with me." Is this an example or nonexample of safe space?
3. You and the mentee are walking by the Super Pit stadium. THE MENTEE SAYS, "Hey, can I ask you something?" After a 5-second pause, your mentee says, "Never mind, it's not important". THE PEER MENTOR SAYS, "Suit yourself. It's better that I don't know." Is this an example or nonexample of providing a safe space?

Be there

1. You are having lunch with the mentee at the union. THE MENTEE SAYS, "My professor told me that I need to buy some art supplies for class. I'd ask for you help finding a store, but you've already helped me so much. You must be tired of helping me." THE PEER MENTOR SAYS, "Not at all, I enjoy helping you whenever I can!" Is this an example or nonexample of being there?
2. You are talking with the mentee through Zoom. THE MENTEE ASKS YOU, "Do you have any advice on how to organize assignments for all your classes?" THE PEER MENTOR SAYS, "I'm not good at organizing assignments either. Your on your own." Is this an example or nonexample of being there?
3. You are hanging out with the mentee in the common area of their residence hall. THE MENTEE SAYS, "I am having trouble connecting my computer to the Wi-Fi. Do you think you can help me?" THE PEER MENTOR SAYS, "Yes, let's figure it out! It'll be fun to work it out!" Is this an example or nonexample of being there?

Offer assistance

1. While going on a walk to the Earth Day event at the University Mall, THE MENTEE SAYS "There are so many people here. I wonder if I can make a friend." THE PEER MENTOR SAYS, "Probably." Is this an example or nonexample of assisting?
2. You are with the mentee outside of the Physical Education Building. THE MENTEE ASKS, "Can you help me find my textbooks for this semester?" THE PEER MENTOR SAYS, "Unfortunately, I don't know where to get textbooks." Is this an example or nonexample of assisting?
3. You are meeting up with the mentee outside of the Art Building. THE MENTEE TELLS YOU, "My professor told us to go buy art supplies for our next class. I've gone to 4 different stores and I can't find what I need." THE PEER MENTOR SAYS, "What do you need? I can try to find it online or see if it's available at another store a little further away." Is this an example or nonexample of assisting?

Encourage

1. You are with the mentee at the Pohl Rec Center. You see a sign advertising an e-sports tournament for a game. THE MENTEE SAYS, “I’ve been planning on signing up. I don’t know if I am good enough to compete with the others.” THE PEER MENTOR SAYS, “You can compete with the best of them!” Is this an example or nonexample of encourage?
2. You receive a text from the mentee after you get out of class. THE MENTEE SAYS “I just finished creating a dress for my Fashion and Design class. I wanted to know what you think about it.” You walk over to the mentee’s residence hall to see the dress. THE PEER MENTOR SAYS, “I don’t like the stitching on the dress.” Is this an example or nonexample of encourage?
3. You are with your mentee having coffee at the Starbucks in the Union. Your mentee has a goal of telling more jokes to friends. The mentee makes a clever joke during the conversation. THE PEER MENTOR SAYS, “That’s hilarious! You are getting funnier every day!” Is this an example or nonexample of encourage?

Problem solve

1. You are with the mentee in the common room of their residence hall. The mentee decides that they want to go eat somewhere on the square. THE MENTEE TELLS YOU, “There’s too many options. I don’t know what I want to eat.” THE PEER MENTOR SAYS, “Do you think there’s a way to narrow the options a little bit so you can have less to choose from?” Is this an example or nonexample of helping to problem solve?
2. You receive a call from your mentee 30 minutes before their regularly scheduled class. THE MENTEE SAYS, “I was trying to open Zoom but it keeps crashing! How am I supposed to attend class if this app doesn’t work?” THE PEER MENTOR SAYS, “I’ll fix it for you, give me the computer.” Is this an example or nonexample of helping to problem solve?
3. You are with the mentee near the Life Sciences Building. You are about to part ways so that you can go to class. However, THE MENTEE TELLS YOU, “My saxophone’s reed is broken. I need to replace it ASAP, but I don’t know where to-go to replace it.” THE PEER MENTOR SAYS, “That sounds like a personal problem.” Is this an example or nonexample of helping to problem solve?

Have fun

1. You are waiting for the mentee to meet with you at the General Academic Building. THE MENTEE SEES YOU AND SAYS, “Hey, I’ve been seeing all kinds of signs around campus about an event called Founders Day. What is that?” THE PEER MENTOR SAYS, “Founder’s day is an annual event on campus. It’s generally crowded so I avoid going.” Is this an example or nonexample of having fun?

2. You are hanging out with the mentee in the common room of the residence hall. You are watching the mentee play Mario Kart and having a conversation with them. THE MENTEE SAYS, “I love playing Mario Kart, but it does get a little boring playing by myself. Can you play with me?” THE PEER MENTOR SAYS, “No, video games are boring.” Is this an example or nonexample of having fun?
3. You are with the mentee at the park. YOU ASK THE MENTEE, “what have you been doing lately?” Your mentee says “I recently watched a great indie film called Eternal Sunshine of the Spotless Mind. It’s so thought provoking!” THE PEER MENTOR SAYS “That does sound great! I would love to hear more about it.” Is this an example or nonexample of having fun?

APPENDIX F

DISCRIMINATION TRAINING QUESTION ARRANGEMENT FOR EACH TARGET BEHAVIOR

Target behavior	Question arrangement
Be patient	NNE
Paraphrase	ENE
Look interested	ENE
Open-ended question	EEN
Reflect	NEE
Control of conversation	NEN
Provide a safe space	EEN
Be there	ENE
Offer assistance	NNE
Encourage	ENE
Problem solve	ENN
Have fun	NNE

Note. E = example and N = nonexample. The arrangement was presented in the order that they appear in the table with the left most letter being presented first, followed by the middle letter being presented second, and third letter being presented last.

REFERENCES

Ames, M. E., McMorris, C. A., Alli, L. N., & Bebko, J. M. (2016). Overview and evaluation of a mentorship program for university students with ASD. *Focus on Autism and Other Developmental Disabilities*, *31*(1), 27-36. https://www.doi.org/10.1177/1088357615583465

Blell, Z. D. *The effects of a communication training workshop on the verbal behavior of caregivers* [unpublished master's thesis]. University of North Texas.

Cederland, M., Hagberg, B., Billstedt, E., Gillberg, I. C., Gillberg, & Gillberg, C. (2008). Asperger and autism: a comparative longitudinal follow-up study more than 5 years after original diagnosis. *Journal of Autism and Developmental Disorders*, *38*, 72-85. https://www.doi.org/10.1007/s10803-007-0364-6

Cooper, J. O., Heron, T. E., & Heward, W. L. (2020). *Applied Behavior Analysis* (3rd ed.). Pearson.

Counselling Tutor. (n.d.). *Reflecting and paraphrasing*. https://counsellingtutor.com/basic-counselling-skills/reflecting-and-paraphrasing/

Custer, T. N., Stiehl, C. M., & Lerman, D. C. (2021). Outcomes of a practical approach for improving conversation skills in adults with autism. *Journal of Applied Behavior Analysis*, *54*, 309-333. https://www.doi.org/10.1002/jaba.752

DiGennaro Reed, F. D., & Henley, A. J. (2015). A survey of staff training and performance management practices: The good, the bad, and the ugly. *Behavior Analysis in Practice*, *8*, 16-26. https://www.doi.org/10.1007/s4061701500445

Elias, R., & White, S. W. (2018). Autism goes to college: understanding the needs of a student population on the rise. *Journal of Autism and Development Disorders*, *48*, 732-746. https://www.doi.org/10.1007/s10803-017-3075-7

Flores, G., & Estudillo, A. G. (2018) Effects of a Peer-To-Peer Mentoring Program: Supporting First-Year College Students' Academic and Social Integration on Campus. *Journal of Human Services: Training, Research, and Practice*, *3*(2), Article 3. Retrieved on September 21, 2020, from https://scholarworks.sfasu.edu/jhstrp/vol3/iss2/3Flores,

Garringer, M., & Jucovy, L. (2007). *Build relationships: a guide for new mentors: effective strategies for providing quality youth mentoring in schools and communities.* Hamilton Fish Institute on School and Community Violence; National Mentoring Center at Northwest Regional Educational Laboratory.

Gelber, N. G., Smith, I., Reichow, B. (2014). Systematic review of articles describing experience and supports of individuals with autism enrolled in college and university programs. *Journal of Autism and Developmental Disorders*, *44*, 2593-2601. https://www.doi.org/10.1007/s10803-014-2135-5

Hamilton, J., Stevens, G., & Girdler, S. (2016). Becoming a mentor: The impact of training and the experience of mentoring university students on the autism spectrum. *PLoS ONE*, *11*(4), 1-13. https://www.doi.org/10.1371/journal.pone.0153204

Hall, R., & Jaugietis, Z. (2011). Developing peer mentoring through evaluation. *Innovative Higher Education*, *36*, 41-63. https://www.doi.org/10.1007/s10755-010-9156-6

Howlin, P., & Moss, P. (2012). Adults with autism spectrum disorder. *The Canadian Journal of Psychiatry*, *57*(5), 275-283. https://doi.org/10.1177/070674371205700502

Huffstetter, M., King, J. R., Onwuegbuzie, A. J., Schneider, J. J., & Powell-Smith, K. A. (2010). Effects of a computer-based early reading program on the early reading and oral language skills of at-risk preschool children. *Journal of Education for Students Placed at Risk*, *15*, 279-298. https://www.doi.org/10.1080/1824669.2010.532415

Hood, S. A., Luczynski, K. C., & Mitteer, D. R. (2017). Toward meaningful outcomes in teaching conversation and greeting skills with individuals with autism spectrum disorder. *Journal of Applied Behavior Analysis*, *50*, 459-486. https://www.doi.org/10.1002/jaba.388

Jaehnig, W., & Miller, M. L. (2007). Feedback types in programmed instruction: a systematic review. *The Psychological Record*, *57*, 219-232. https://www.doi.org/10.1007/BF03395573

Johnson, D. A. (2014). The need for an integration of technology, behavior-based instructional design, and contingency management: an opportunity for behavior analysis. *Mexican Journal of Behavior Analysis*, *40*, 58-72. https://www.doi.org/10.5514/rmac.v40.i2.63665

Johnson, K. R., & Layng, T. V. J. (1994). The morningside model of generative instruction. In R. Gardner III, D. M. Sainato, J. O. Cooper, T. E. Heron, W. L. Heward, & J. W. Eshleman (Eds.), *Behavior analysis in education: Focus on measurably superior instruction*. Pacific Grove, CA: Brooks/Cole.

Johnson, D. A., & Rubin, S. (2011). Effectiveness of interactive computer-based instruction: a review of studies published between 1995 and 2007. *Journal of Organizational Behavior Management*, *31*, 55-94. https://www.doi.org/10.1080/01608061.2010.541821

Johnson, K. & Street, E. M. (2012). From the laboratory to the field and back again: Morningside Academy's 32 year of improving students' academic performance. *The Behavior Analyst Today*, *13*(1), 20-40. https://www.doi.org/10.1037/h0100715

Kapp, S. K., Gantman, A., Laugeson, E. A. (2011). Transition to adulthood for high-functioning individuals with autism spectrum disorders. In M. R. Mohammadi (Ed.), *A Comprehensive Book on Autism Spectrum Disorders* (pp. 451-478). IntechOpen. https://www.doi.org/10.5772/975

Kieta, A. R., Cihon, T. M., & Abdel-Jalil, A. (2019) Problem solving from a behavioral perspective: implications for behavior analysts and educators. *Journal of Behavioral Education*, *28*, 275-300. https://www.doi.org/10.1007/s10864-018-9296-9

Kisamore, A. N., Schnell, L. K., Goodwyn, L. A., Carrow, J. N., Taylor-Santa, C., & Vladescu, J. C. (2018). Behavior analytic perspectives on teaching complex social behavior to children with autism spectrum disorder. In C. B. McNeil, L. B. Quetsch, & C. M. Anderson (Ed.), *Handbook of parent-child interaction therapy for children on the autism spectrum* (pp. 129-146). Springer Nature Switzerland. https://www.doi.org/10.1007/978-3-030-03213-5_8

Kram, K. E. (1983). Phases of the mentor relationship. *The Academy of Management Journal*, *26*(4), 608-625. https://doi.org/10.2307/255910

Kram, K. E., & Isabella, L. A. (1985). Mentoring alternatives: The role of peer relationships in career development. *The Academy of Management Journal*, *28*(1), 110-132. https://doi.org/10.2307/256064

Layng, T. V. J. (2019) Tutorial: Understanding concepts: Implications for behavior analysts and educators. *Perspectives on Behavior Science*, *42*, 345-363. https:/www.doi.org/10.1007/s40614-018-00188-6

Lucas, R. & James, A. I. (2018). An evaluation of specialist mentoring for university students with autism spectrum disorders and mental health conditions. *Journal of Autism and Developmental Disorders*, *48*, 694-707. https://www.doi.org/10.1007/s1080301733031

Mann, C. C., & Karsten, A. M. (2019). Efficacy and social validity of procedures for improving conversational skills of college students with autism. *Journal of Applied Behavior Analysis*, *53*(1), 402-421. https://doi.org/10.1002/jaba.600

Mentoring Partnership of Southwestern Pennsylvenia. (n.d.). *Peer mentor handbook*. Mentoring Partnership of Southwestern Pennsylvania.

Michael, J. (1993). Establishing operations. *The Behavior Analyst*, *16*, 191-206. https://www.doi.org/ 10.1007/BF03392623

Michael, J., Palmer, D. C., & Sundberg, M. L. (2011). The multiple control of verbal behavior. *The Analysis of Verbal Behavior*, *27*, 3-22. https://www.doi.org/10.1007/BF03393089

Nuernberger, J. E., Ringdahl, J. E., Vargo, K. K., Crumpecker, A. C., & Gunnarsson, K. F. Using a behavioral skills training package to teach conversational skills to young adults with autism spectrum disorders. *Research in Autism Spectrum Disorders*, *7*, 411-417.

Parsons, M. B., Rollyson, J. H., & Reid, D. H. (2012). Evidence-based staff training: A guide for practitioners. *Behavior Analysis in Practice*, *5*(2), 2-11. https://www.doi.org/10.1007/BF03391819

Sarokoff, R. A., & Sturmey, P. (2004). The effects of behavioral skills training on staff implementation of discrete-trial teaching. *Journal of Applied Behavior Analysis*, *37*(4), 535-538. https://www.doi.org/10.1901/jaba.2004.37-535

Saunders, K. J., & Williams D., C. (1998). Stimulus-Control Procedures. In K. A., Lattell & M. Perone (Eds.) *Handbook of Research Methods in Human Operant Behavior* (pp. 193-228). Springer. https://doi.org/10.1007/978-1-4899-1947-2_7

Skinner, B. F. (1957). *Verbal behavior*. Prentice-Hall Inc.

Taylor, B. A., LeBlanc, L. A., & Nosik, M. R. (2019). Compassionate care in behavior analytic treatment: Can outcomes be enhanced by attending to relationships with caregivers? *Behavior Analysis in Practice*, *12*, 654-666. https://www.doi.org/10.1007/s40617-018-00289-3

Tennyson, R. D., & Park, O. C. (1980). The teaching of concepts: A review of instructional design research literature. *Review in Educational Research*, *50*(1), 55-70. https://www.doi.org/10.2307/1170030

Terrion, J. L., & Leonard, D. (2007). A taxonomy of the characteristics of peer mentors in higher education: findings from a literature review. *Mentoring & Tutoring*, *15*(2), 149-164.

Tiemann, P. W., & Markle, S. M. (1990) *Analyzing instructional content: A guide to instruction and evaluation*. Seattle, WA: Morningside Press.

Tucker, M., Gamba, J., & Walker, D. J. (2016). The effects of single- versus- multiple-exemplar training on vocal identification of artists' styles. *Journal of Behavioral Education*, *25*, 189-205. https://www.doi.org/10.1007/s10864-015-9237-9

Roux, A. M., Shattuck, P. T., Rast, J. E., Rava, J. A., & Anderson, K. A. (2015). *National autism indicators report: Transition into young adulthood*. Philadelphia, PA: Life Course Outcomes Research Program, A.J. Drexel Autism Institute, Drexel University.

Wolf, M. M. (1978). Social validity: The case for subjective measurement or how applied behavior analysis is finding its heart. *Journal of Applied Behavior Analysis*, *11*, 203-214. https://www.doi.org/10.1901/jaba.1978.11-203

U.S. Bureau of Labor Statistics. (2020, May). *Learn more, earn more: Education leads to higher wages, lower unemployment*. https://www.bls.gov/careeroutlook/2020/data-on-display/education-pays.htm

Van Bergeijk, E., Klin, A., & Volkmar, F. (2008). Supporting more able students on the autism spectrum: college and beyond. *Journal of Autism and Developmental Disorders*, *38*, 1359-1370. https://www.doi.org/10.1007/s10803-007-0524-8

Vollmer, T. R., Peters, K. P., Kronfli, F. R., Lloveras, L. A., & Ibañez, V. F. (2020). On the definition of differential reinforcement of alternative behavior. *Journal of Applied Behavior Analysis*, *53*(3), 1299-1303. https://www.doi.org/10.1002/jaba.701

White, S. W., Elias, R., Salinas, C. E., Capriola, C. M., Asselin, S. B., Miyazaki, Y., Mazefsky, C. A., Howlin, P., & Getzel, E. E. (2016). Students with autism spectrum disorder in college: results from a preliminary mixed methods needs analysis. *Research in Developmental Disabilities*, *56*, 29-40. https://www.doi.org/10.1016/j.ridd.2016.05.010

Yomtov, D., Plunkett, S. W., Efrat, R., & Garcia Marin, A. (2017). Can peer mentors improve first-year experiences of university students? *Journal of College Student Retention*: *Research, Theory, & Practice*, *19*(1), 25-44. https://www.doi.org/10.1177/1521025115611398